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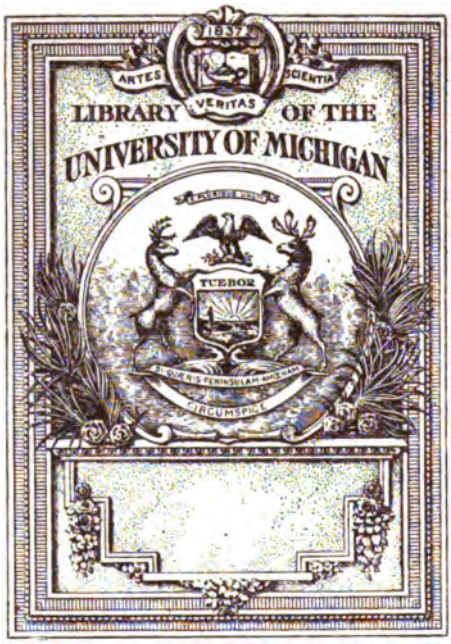

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THE UNIVERSITY AND THE COMMONWEALTH

ADDRESSES AT THE INAUGURATION
OF LOTUS DELTA COFFMAN, Ph.D.
AS FIFTH PRESIDENT OF THE
UNIVERSITY OF MINNESOTA
MAY 13, 1921

MINNEAPOLIS
PUBLISHED BY THE UNIVERSITY OF MINNESOTA
1921

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GENERAL PROGRAM

Thursday, May Twelfth

8:15 p. m. Reception to Guests, Delegates, and Faculties by the Board of Regents

Friday, May Thirteenth

9:15 a. m. Academic Procession from the Library Building to the Armory
10:00 a. m. Inaugural Session — *The Armory*
12:00 m. Review of the R.O.T.C. — *Parade Ground*
12:30 p. m. Luncheon to Guests, Delegates, and Faculties — *Ball Room, Minnesota Union*
2:30 p. m. Symposium on the University and the Commonwealth — *Little Theater, Minnesota Union*
5:00 p. m. En route to University Farm
5:15 p. m. Livestock Parade
6:00 p. m. Social and Rest Interval — *Home Economics Building*
6:30 p. m. Dinner to Guests, Delegates, and Faculties — *Main Dining Hall*

Saturday, May Fourteenth

9:30 a. m. Symposium on the University and the Commonwealth — *Little Theater, Minnesota Union*
12:20 p. m. Establishment of Presidents' Lawn — *Campus Knoll*
1:00 p. m. Luncheon Hour
2:00 p. m. Automobile Tour of the Twin Cities
6:30 p. m. Dinner for Men Alumni of the University — *Ball Room, Minnesota Union*

INAUGURAL SESSION

Friday Morning, May Thirteenth

9:15 a. m. — *Library Building*

ASSEMBLY FOR ACADEMIC PROCESSION: Guests, Delegates, and Faculties

10:00 a. m. — *The Armory*

INAUGURATION CEREMONY

The Honorable Fred B. Snyder, *Presiding*

PROCESSIONAL: March — *Carlyle Scott*
THE UNIVERSITY BAND
MICHAEL JALMA, Conductor

INVOCATION
The Reverend JOHN EDWARD BUSHNELL, B.A., D.D., Pastor of Westminster Presbyterian Church

MUSIC: Festival Overture — *Leutner*
THE UNIVERSITY BAND

ADDRESS
President Emeritus WILLIAM WATTS FOLWELL, M.A., LL.D., University of Minnesota

ADDRESS
President Emeritus CYRUS NORTHROP, B.A., LL.B., LL.D., University of Minnesota

MUSIC: Finlandia — *Sibelius*
THE UNIVERSITY BAND

418253

INAUGURATION CEREMONY

PRESENTATION OF THE PRESIDENT

The Honorable FRED B. SNYDER, B.A., President of the Board of Regents

INAUGURAL ADDRESS

President LOTUS DELTA COFFMAN, Ph.D.

SONG: Hail, Minnesota!

Minnesota, hail to thee!
Hail to thee, our College dear!
Thy light shall ever be
A beacon bright and clear;
Thy sons and daughters true
Will proclaim thee near and far;
They will guard thy fame
And adore thy name;
Thou shalt be their Northern Star.

Like the stream that bends to sea,
Like the pine that seeks the blue;
Minnesota, still for thee,
Thy sons are strong and true.
From thy woods and waters fair,
From thy prairies waving far,
At thy call they throng,
With their shout and song,
Hailing thee their Northern Star.

BENEDICTION

Professor Emeritus JOHN CORRIN HUTCHINSON, B.A., University of Minnesota

RECESSIONAL: March *Unrath*

THE UNIVERSITY BAND

12:00 *Parade Ground*

REVIEW OF THE RESERVE OFFICERS TRAINING CORPS

LUNCHEON: Given by the University to Guests, Delegates, and Faculties
Governor JACOB A. O. PREUS, *Toastmaster*

12:30 *Ball Room, Minnesota Union*

EDUCATIONAL CONFERENCE

Friday Afternoon, May Thirteenth

President LOTUS DELTA COFFMAN, *Presiding*

2:30 p. m. *Little Theater, Minnesota Union*

SYMPOSIUM ON THE UNIVERSITY AND THE COMMONWEALTH

ADDRESS: The University and the Development of Agriculture

FRANK LEROND MCVEY, Ph.D., LL.D., President of the University of Kentucky

ADDRESS: The University and Professional Training

JAMES EARL RUSSELL, Ph.D., LL.D., Dean of Teachers College Columbia University

ADDRESS: The University in the Development of Character and Culture

HENRY SUZZALLO, Ph.D., LL.D., President of the University of Washington

ADDRESS: The University and Research

VERNON LYMAN KELLOGG, M.S., LL.D., Secretary of the National Research Council; Sometime Professor of Entomology, Leland Stanford Junior University

5:00 p. m.

En route to University Farm on Inter-Campus car line

EDUCATIONAL CONFERENCE

5:15 p. m.

Parade of the winners in the Livestock Show held under the auspices of the Livestock Club

Delegates and guests are invited to avail themselves of this opportunity to inspect the various buildings on the Agricultural Campus.

6:00 p. m. *Fireside Rooms, Home Economics Building*

Social and Rest Interval

Friday Evening, May Thirteenth

6:30 p. m. *Main Dining Hall, University Farm*

DINNER: Given by the University to the Guests, Delegates, and Faculties
President LOTUS DELTA COFFMAN, *Toastmaster*

Saturday Morning, May Fourteenth

9:30 a. m. *Little Theater, Minnesota Union*

SYMPOSIUM ON THE UNIVERSITY AND THE COMMONWEALTH

ADDRESS: The Development of the College of Commerce and Business
JAMES EDWARD HAGERTY, Ph.D., Dean of the College of Commerce and Journalism, Ohio State University

ADDRESS: The University and Public Health
CHARLES PHILLIPS EMERSON, B.A., M.D., Dean of the School of Medicine and Professor of Medicine, Indiana University

ADDRESS: The University and the Development of the Technological Sciences
CHARLES RUSS RICHARDS, M.M.E., D.Eng., Dean of the College of Engineering, University of Illinois

ADDRESS: The University and Jurisprudence
WILLIAM REYNOLDS VANCE, Ph.D., LL.D., Professor of Law, Yale University

12:20 p. m. *Campus Knoll*

DEDICATION OF PRESIDENTS' LAWN
Tree-Planting Ceremony: A tree will be planted for each of Minnesota's five presidents.

White Elm	President Folwell
Red Oak	President Northrop
Hard Maple	President Vincent
White Ash	President Burton
Black Walnut	President Coffman

1:00 p. m.

LUNCHEON HOUR
Guests and delegates may secure luncheon at Shevlin Hall cafeteria.

2:00 p. m.

Automobile tour of the Twin Cities arranged by the Alumni of the University

Guests and delegates are requested to assemble promptly in front of Shevlin Hall.

6:30 p. m. *Ball Room, Minnesota Union*

DINNER for Men Alumni of the University
THOMAS FREEMAN WALLACE (B.A. 1893, LL.B. 1895), *Toastmaster*

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MR. FOLWELL'S ADDRESS

WILLIAM WATTS FOLWELL, M.A., LL. D.
President Emeritus of the University of Minnesota

MR. SNYDER: The University opened its doors for the first time to students of collegiate grade in September 1869, some eighteen years after it had been created by act of the Territorial Legislature. In the following December the venerable gentleman who is to be the first speaker of the day was inaugurated. The exercises took place in the assembly room on the third floor of the west wing of the old Main Building. In the course of his address the new President set forth his views as to the organization of the institution and the basic principles underlying its management. More than fifty years have passed since that first inauguration and although many changes have been wrought in and about the University the plan of organization and the principles laid down by him have in the main remained in force to this day. We rejoice that he has been spared to this late day in vigor of mind and body to take part in these exercises. President Emeritus William Watts Folwell will address you.

MR. FOLWELL: It was my fortune not long ago to sail away by moonlight in an airship, and "in the time that the morning did strow roses and violets in the heavenly floors against the coming of the Sun," to

alight in a strange land called Arcadia,—a land of peace and plenty where richer and poorer, without envy and without scorn, lead together the simple life—the Arcadian life of the poets. Only a poet could describe the scene before me. I do not attempt it. The agriculture and industries of the happy people, their means of transportation and exchange, their social customs and government, their religion, all at once challenged my curiosity, but being a pedagog, I was most concerned to learn about their ideas and plans for the training of their children and youth. I resolved therefore to make them my first study. If I may have your leave, Mr. President, and your indulgence, Respected Audience, instead of an address I will merely read some notes of my observations.

My first observation was that they had no spelling books. Young children could read so soon as they had been shown the letters of the phonetic alphabet (without useless capitals) and the sounds they severally stood for—as could the Sioux Indians when the Pond brothers kept school in 1835 at the Lake Harriet Mission. Billions of hours of spelling lessons were thus saved for other learning. I noticed a close intimacy and coöperation between parents and primary teachers, and frequent consultations in regard to the reading, the recreations, the health, and especially the behavior of the children. There was a compendius formula of manners and morals, which at bottom are the same thing, elaborated out of the golden rule. All children were required to memorize and frequently to recite it.

The Arcadian secondary education seemed to me more fully developed than in my own country. Receiving pupils from the primary schools they retained

them during the whole period of instruction which ought to be carried on under a school regime—" under tutors and governors." This period lasted about two years longer than the high-school courses at home. The youth were thus kept in their own homes, and the continued coöperation of parents and teachers maintained a wholesome discipline during the critical period of adolescence. Long experience had determined what subjects were the proper ones to be taught in the secondary period, and while there was some liberty allowed in the choice of general lines there was no great range of casual election of studies by inexperienced youth.

There were three main purposes of the secondary education of Arcadia. First came the preparation for citizenship with emphasis on the duties of obedience to law, voting, tax-paying and the sacrifice of property, time, and even life itself for the common good. The second object was the preparation for higher cultural or professional studies. The third, and most highly regarded, was the inculcation of character and right behavior in all relations of life. There was a science of conduct drawn from the law of the land, and the experience of civilized men and the higher law written in the human conscience. Throughout the whole period the youth were trained to look forward to lives of usefulness, not of pleasure, and to think more of doing than of getting. There was therefore a pervading atmosphere of soberness, making the school a consecrated place illuminated by the joys of righteous endeavor. While there were differences of creed and ritual among the Arcadians there was a common appreciation of the beauty of holiness and a universal demand that the school should train for righteousness, by precept as

well as example. The People's College completed general education of the Arcadian youth, and normally all of them passed through it.

I turned from the secondary schools in which the instruction was uniform to the institutions of the superior education. Here was the utmost diversity in aims and methods. Every art and trade and employment had its schools. Science and invention had long ago emancipated the Arcadians from beast-like labor. No long apprenticeship was necessary for any craft. The school had taken its place. Professional and technical schools I found in great numbers and variety—of agriculture and its specialties of horticulture, fruit culture, dairying, and others, of engineering in many branches, architecture, mining, and forestry; and what was most novel, schools of air navigation. Certain schools, which in some ancient time were of first importance, survived but in diminished or much altered guise. In a land where crime was unknown and universal conciliation of disputes was practiced, there was little left for the schools of law but to teach property law in general, and in particular conveyancing, the probate code, and the statute of frauds.

The quiet, industrious lives of the Arcadians, their freedom from vice, luxury, and dissipation, and the universal use of prophylactics had abolished epidemic diseases and so mitigated others that medical schools had been converted into schools of public health, like that proposed for our University many years ago.

The instruction in all these institutions, properly called schools and not colleges, was highly specialized, so that small room could be spared for the continuance of general culture or for elective studies. The need of

efficiency in these schools to provide a supply of finely trained and expert practitioners of the several arts was a sufficient reason for granting them public support and subjecting them to public supervision. The idea of using them for the creation of professional monopolies was not forbidden because believed impossible. All testimonials of proficiency were awarded only after public tests and examinations.

The internal administration of the schools was generally left to a governing board of teachers acting under general law and regulations established by the state or municipal Board of Education, to which their reports were made and which took care of their budgets.

I observed at length that the Arcadians had a still higher grade or plane of education surmounting their superior education,—supreme education in a single institution rightly named the University of Arcadia. It was not a coördinate institute along with professional and technical schools, but overtopped them as the Basilica of St. Peter towers over the parish churches of Rome. There was no unnatural mechanical alliance with bread-and-butter schools, giving their executives or committeemen opportunity to tinker with persons and things which did not concern them.

This university was a place of disinterested study and research without thought or expectation of material results or of personal emolument; its objects being the enlargement of general culture and the extension of the boundaries of knowledge, by observation, experiment, record, and publication, in all branches of science, history, and philosophy. The supreme interest was ever in the study of humanity in its economic, social, and spiritual relations. I found that the Arcadians

were not content, as some of our educators seem to be, to restrict the activity of their university to the bare acquisition and imparting of knowledge, for the mere sake of knowledge. They had no use for mere consumers of knowledge, but expected from their university men and women some who could transform learning into wisdom and insight into vision, to counsel and guide in great affairs of state, nation, and the world.

The Arcadian university was no school with roll calls, marking systems, and classes. Each student had his chosen field of study, but there were temporary groups of students who desired to coöperate in some line of research or listen to the same lectures. As to graduations, there seemed to be no level routine. From time to time decorations were bestowed on students and investigators for notable attainments and discoveries, but there was no annual delivery in bulk of doctorates as testimonials of industrious mediocrity.

The faculty was composed of experts each in his field but not narrow specialists content to dig in the dark like underground moles—rather of such as had " sowed the seed of general culture in the furrow of a strong specialty," to borrow a phrase from Michelet. Emancipated from all mere school-keeping, they devoted themselves without distraction to instruction and research. Assured of a sufficient support during working years and a decent stipend thereafter, they were never harassed by the " cares of the world or the deceitfulness of riches." An offer of higher pay to one of them to enter other employment was considered an insult. There was no government requiring any sanction by penalties, but merely rules of order proclaimed by a council of senior professors presided over for short periods in turn by one of their number, who had a small

allowance for clerical help. It was not considered reputable to decline or avoid this irksome duty which consumed precious time.

There was some kind of public function in progress, but I observed that the faculty attended in their ordinary dress—that of the Arcadian citizen. If ever they had made use of the thirteenth century garb, the scholastic gown, the tasseled hat, and flamboyant hood, they had ages ago discarded them, because inconsistent with their democracy. It is a strange thing—and an instance of the inscrutable tyranny of fashion,—that after some three centuries these symbols of aristocracy have within three decades invaded our American, amphibious school-college-universities—the very breeding places of pure democracy. But who wants to squabble about millinery?

The ultimate governing power of the university was reposed in a syndicate chosen from the body of university alumni, holding office during pleasure. Its supreme duty was that of confirming the selection of new members of the teaching staff as vacancies occurred, occasioned by death or retirement. It did not enter into details of administration.

The financing of the Arcadian university was the most surprising of all the facts observed by me. I should say here that these Arcadians were no Utopians, no crack-brained communists feeding from a common trough. They held rock-fast to the institution of private property; but as I was informed, they did not invest any chartered cliques, such as we call corporations, with the unalienable rights belonging to human beings antecedent to government and law. In a land where the simple life was universal, personal extravagance unknown, and all adult persons engaged productively,

wealth—ever socially disadvantageous—often became a burden to its custodians, and they were constantly on the lookout for ways to get honestly rid of the surplus. Graduates of the university who became embarrassed with riches found it the dearest object of bestowal. Their gifts and endowments at times became so immense that they had to be temporarily refused, and there was a waiting list of competitors for the privilege.

The Arcadians had the fine taste to establish their university in a sequestered spot far from the grime and racket of cities, "far from the madding crowd," by a lakeside with an issuing river, and a great surrounding forest. On its domain a little town had grown up of university people and some necessary merchants and artisans. The ample lawns and decorative shrubs about the modest dwellings formed a charming parklet. The buildings of the university, more attractive for proportion than decoration and, hidden by foliage, made so little show that their presence was no disfigurement of the landscape. There was but one exception to their simplicity—a concession to an art impulse long suppressed but irresistible. The exception was the central library building, as delicately beautiful as the Taj Mahal of India, but statelier, far statelier. It was covered with a chemical coating which preserved the eternal whiteness of its marble, and, varying with the declination of the sun, reflected the hues of the solar spectrum.

Before I was aware, the day had passed. The shades of evening were falling. The gold of the great library tower, borrowed from the setting sun, had changed to violet, and from a peal of sweet bells floated

out an enchanting curfew melody. It ceased:—What I heard was that Japanese gong at the foot of the staircase chiming the household reveille.

MR. NORTHROP'S ADDRESS

CYRUS NORTHROP, B.A., LL.B., LL.D.
President Emeritus of the University of Minnesota

MR. SNYDER: After a service of fifteen years President Folwell resigned. He was succeeded by a man who came from Yale. In a conversation with him a few days ago he stated that from the time he was sixteen years of age, he had combated a tendency to tuberculosis of the lungs. He said, in his efforts to guard off this threatened malady, he had so developed the air passages of his lungs that he had increased his chest expansion up to six inches. It may be that his old time friend Chauncey Depew knew of this lung capacity when at a notable banquet in the East he introduced him as the "Cyclone of the West." The response came in a flash that Chauncey ought to know because he was a good judge of wind. But that is on the side. He came from Yale to Minnesota. He brought with him a Christian character and a love for his fellow men that permeated the institution for twenty-seven years and gradually spread throughout the state. Now in his retirement the affection of the people clings to him and is a source of good cheer, comfort, and satisfaction to him. He is to-day the Nestor of the commonwealth, eloquent of speech, wise of counsel, and loved as few other men have been loved in the history of the Northwest. President Emeritus Cyrus Northrop will address you.

President Emeritus Northrop

MR. NORTHROP: The great question which interests us to-day is what is to be the future of the University. The increased cost of running the institution, in consequence of the tremendous increase in the number of students and the high prices for both labor and equipment, has led to a real crisis in the University life—a crisis that has indeed been passed—probably safely passed, but yet the danger has not entirely disappeared. Other institutions are looking for capable professors and are insidiously offering positions to the men whom the University can least afford to lose.

Under these circumstances the character of the man who is to preside over the University, for many years in the future—as we hope, is of vital importance. Perhaps never in the history of the University has it been more important that the new President should be exactly the right man. And I am sure that the new President *is* the right man. The service he has already rendered clearly demonstrates his wisdom and ability. He has already won the confidence of his entire constituency—regents, faculty, students, legislature, and people of Minnesota. He has successfully carried on the negotiations with the legislature and won such appreciation as could reasonably be expected. He has not lost courage when the skies looked dark, and to-day I am sure he faces the future with an optimistic spirit that is itself an omen of final victory. I congratulate the University on having secured him for its President. I congratulate him on having the splendid opportunity of doing here a life work that shall be invaluable to the state of Minnesota and that shall secure for himself a lasting reputation as a great administrator and a great educator. The work he has to do is a great work. The University of Minnesota is a great institution. Dr. Coffman I am

sure appreciates the dignity of the position he is called upon to fill and the importance of the work he is called upon to do and he will devote himself to that work with a conscientious fidelity and an ever increasing enthusiasm that will of themselves prove guaranties of success. As one of his predecessors I welcome him most heartily, happy that the responsibilities which in part once rested upon me are now transferred to another so eminently capable of bearing them successfully and of carrying forward the work of the University to heights of attainment never realized in the past.

THE UNIVERSITY'S BEGINNINGS

THE HONORABLE FRED B. SNYDER, B.A.
President of the Board of Regents, University of Minnesota

PERHAPS it may be set down as an accepted truth that men who do really great things are men who started from small beginnings, are beset with discouragements, overcome obstacles, and in the end win success. Nations also achieve greatness through adversity. Likewise institutions rendering public service often accomplish their best work after a bitter struggle to exist. Of this latter class the University of Minnesota is a good example.

This University was founded by territorial act in 1851. It received from the government a grant of 46,000 acres, much of it timber land, scattered over the territory. Its first location was on the site where the old Exposition Building now stands near Central Avenue. Four years later the location was changed to the present site, then about twenty-five acres in extent. In the following year the legislature authorized the regents to borrow $15,000 for the erection of a building and to mortgage its campus to secure the payment of the money. A contract was then let to erect a building to cost $49,600. The board expected to meet this obligation with money received from the sale of its timber along the Rum River; but alas—there was a drouth and the logs did not come down, so there was no money. The mortgage defaulted. Then the panic of '57 swept the land. The University lay helpless at the mercy of

its creditors. In '58 the legislature authorized the regents to mortgage its Congressional lands to raise an additional $40,000; but business was so prostrated that only $32,000 could be realized out of this amount. The net result was a greater debt constantly increasing with a high rate of interest, and the building, campus, and Congressional lands all mortgaged as security.

When the first gun was fired at Fort Sumter announcing the beginning of the dark period of the Civil War, the University owed approximately $100,000 and was bankrupt. The governor of this state then recommended to the legislature the appointment of a commission to pay the debts of the University by turning over to its creditors in settlement, if possible, its campus, its building, and its lands. An effort was also made in the legislature to convert the building into a home for the insane. Out of this deplorable condition the institution was in three years time rescued by three men appointed by the legislature, one of whom afterwards became known as the "Father of the University." After settling all debts there remained the campus, the building, and 32,000 acres of land. After eighteen years of trial and tribulation, the University opened its doors to the public.

From that day to this, although the growth of the University at first was slow, the institution has gone forward by leaps and bounds. The enrollment of thirteen of collegiate grade fifty years ago has grown to eight thousand. Its properties could not be replaced to-day for less than fifteen millions of dollars. The turnover of money in the administration of its affairs, including $4,000,000 from the state, and $2,000,000 from other sources, will be approximately $6,000,000 next year.

The University's Beginnings

The growth of the institution has now reached that point where people are asking what it means and where is it to stop. Fundamentally this tremendous growth is due to the character of our industries, our climate, the nature of the people themselves, and the fact that the people demand adequate opportunities for the education of their youth.

At first Minnesota was the home of the hunter because the forests, streams, and prairies teemed with fur-bearing animals and the fur, owing to the cold winters, was of the best grade. In those days there were no highways but the rivers and trails over which the carts of the early frontiersmen transported the furs from distant points to St. Paul. As the hunter killed off the game the lumbermen of New England drifted into the state and made lumbering the second great industry. As the timber was cut settlers came in and agriculture in a small way was begun. But the vast prairie land reaching into the Canadas was not touched until a railroad was constructed to the Red River Valley and the harvester was invented thus making it possible to cultivate our fields on a broad scale, to harvest the ripening crops quickly, and to transport the grain to market. Following the opening of the prairie lands the milling industry was built up at the Falls of St. Anthony, and the Hungarian roller system was introduced making Minnesota known the world 'round for her high grade of wheat and flour product. After the opening of the prairie lands diversified farming was introduced largely through the Agricultural Department of the University and this was soon supplemented with dairying and stock-raising. To this was added in later days the opening of the mineral wealth in

northern Minnesota thus rounding out the economic growth of the state.

The character of these industries and the rigorous climate of the state naturally called into our territory the class of people who are accustomed to combat cold and courageously meet and overcome obstacles in the path of progress. Our population is made up roundly of seventy-five per cent of the blood of Norway, Sweden, and Germany. The balance are chiefly from the stock of the colonial states and the Northwest Territory. Such a people and the children of such a people make a virile, progressive race, an ambitious race, a forward-looking race. They are not afraid to toil. They are frugal and thrifty. They have time to read in the long winter nights. They keep themselves well informed. They know the value of education, as witness the schools of every grade throughout the state for the erection and support of which they willingly tax themselves. They want their children to have more culture; they want them to have advantages that they themselves did not have. They want them to realize the blessings of a free government under which they live, move, and have their being. So it is, we find all the schools running full speed and over-crowded, with the result that the people are suddenly startled to find three thousand freshmen seeking admission to the University each year.

Is this an undesirable condition? Rather is it not due to the coördination of the whole system of state education from the common schools to the University which makes the result inevitable? If you would change the result why not first change the factors which produce the result? Are the people who pay taxes to support the whole system to be told their youth can not

be admitted because the University is too big? If so, how is the limit to be made? Will you fix the limit by legislative act? If so, whose children shall make up the limit? Will you raise the tuition to admit only the rich, and bar the fifty-eight per cent of our students who are self-supporting in whole or part, and who in after life make our best citizens? Will you raise the standard of admission so high that only those making learning a profession shall enter? Or will you permit it to be throttled, discouraged, dissipated by starving it for want of sufficient funds to maintain a first-class institution manned by a staff of first-class men? This latter calamity nearly happened at this last session of the legislature. If the additional $1,000,000 for the biennium had not finally been granted for support the University would have sunk to the level of a second-rate institution. As it is it will be difficult in every case to pay the men of higher teaching grade, who give standing to the institution in the educational world, salaries on a par with men of the same grade in Michigan and Wisconsin, thus making us a possible target for those who wish to pick off our best men. Is it too much to hope that the Educational Committee appointed by the legislature to make a survey of the educational problems of the state, will, in its report to the next legislature propose a method of financing the University, which will for all time place the institution on a more satisfactory financial basis than at present?

The burning question confronting the University in the next decade is how large shall it become and how shall it be financed.

The answer will in the end come from the people themselves. They will insist upon providing for their youth the best in the way of education the state can

afford. They will willingly tax themselves to that end. Have no fear for the future of the University. It has come through the fire of trials and tribulation. It has mounted to heights undreamed of by its founders. It has paid for itself and will pay for itself many times again in establishing improved agricultural methods; in advancing dairy stock; in stimulating general industrial progress; in the culture of the people; and in the happiness of the fireside. It has built and is building well-trained men and women of character to go out into every walk of life with a reverence for God, a devotion to country and a loyalty to our free institutions, thus fulfilling the provision in our Constitution which declares that the safety, the perpetuity, and integrity of the Republic rest upon the enlightenment of all the people.

Lotus Delta Coffman it is now my duty and pleasure on behalf of the Board of Regents to notify you formally of your election to the presidency of the University of Minnesota for an indeterminate period. The members of the board are unanimous in your selection. They feel that in your choice they have found the right man for the presidency, and after some months of actual experience with you at the helm they are firmly convinced that no better man could be found for that important position. They are especially gratified to know that the staff of the University of Minnesota offered such a man. Your elevation has toned-up and advanced the morale of the whole teaching staff of the University.

We appreciate the magnitude of the task you have undertaken. But you have youth, strength, and courage. You were reared on a farm. You are

accustomed to work over time. I am sure you will meet difficulties without complaining. We know that you can not do it all alone. On our part, and I speak for every member of the board, we promise to share your burdens as much as possible. As a pledge of our affection, esteem, and the promise of our united and individual support, I give you my hand and in so doing, subject only to the powers vested by law in the Board of Regents, vest you with authority to manage and direct the affairs of the University of Minnesota.

INAUGURAL ADDRESS

LOTUS DELTA COFFMAN, PH.D.
President of the University of Minnesota

THE history of public education in America is a story of achievement. To the student of education, it reads like romance. No adequate account of it has ever been written. Some day some one who knows how to wield a master's pen will attempt it, and the greatest epic of civilization will be produced. To recount the struggles of a free people to establish a system of popular education which in its infancy bore the stigma of poverty and charity, but in latter days is the expression of the hopes and ambitions, of the faiths and aspirations of the proud descendants of that people is a task worthy of the noblest and most gifted mind. To recount the struggles of a people, to preserve and to perpetuate the principles of freedom of worship, the right of assembly, a trial by one's peers, and the opportunity for fair discussion is to retell the story of American education, for through it and only through it, can we insure an intelligent and wise application of these inalienable principles. Both the sanctity and the meaning of our political institutions rest in the final analysis upon the kinds of schools we maintain.

This school system of ours did not spring into existence full grown. It is the product of evolution. Its roots lie far back in the past. From the beginning it has been regarded as society's most sensitive agent for saving time and labor and also as a highly specialized

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PRESIDENT EMERITUS FOLWELL
1869

PRESIDENT COFFMAN
1921

instrument consciously organized to provide training in citizenship. Thomas Jefferson clearly recognized the importance of this latter consideration. When he declared that a free government can not endure without public education, he gave a mighty impetus to its cause. Successful public schools everywhere became radiant points of imitation. The right of sovereignty changed from groups that voluntarily taxed themselves to groups that compulsorily taxed themselves.

From then until now, decade after decade, the common schools have advanced with uncertain and halting steps. Could we have looked into the future then as we can examine history now, we should have known that the future of the schools was secure, as their foundations were rooted in the idealism of a people who cherished not merely the right to worship God according to the dictates of their own conscience, but also the privilege of educating their children in accordance with the principles of freedom and equality of opportunity. These are not principles to be exercised without discretion. They are something to be achieved. The right of free worship and equality of political opportunity have almost, if not quite, been realized in this country. But there are other types of liberty for which many are struggling that have not yet been commonly accepted. They are still in the process of formulation. Even intellectual liberty, that is, the right to discover truth and to tell the whole truth in order that the truth may make us free, is not universally received and not always treated with the cordiality that it deserves, and yet it is the only stimulus to science and the only true basis of progress.

The fundamental tenets of popular education in America have never contemplated aristocratic forms of

education, the cultivation of class interests, or the protection of special privileges. On the contrary, since the middle of the nineteenth century, the common schools, —the product of that proud, new tradition that all the property shall be taxed for the education of all the children—have been universally regarded as the servant of every one, not the servant of a few.

Almost contemporaneous with the establishment of a system of common schools, our forefathers began to enact compulsory education laws, fixing the upper age limit in some instances as high as fourteen. Apparently these pioneers held that the level of trained intelligence needed by all the people for the solution of the problems of that day and generation should be graduation from the common schools. It was generally recognized that life was comparatively simple, and its problems easy of solution. On the other hand, there rested deep in the hearts of the common people, the firm conviction that a certain amount of general training was necessary to insure mutual understanding and social intercourse. These pioneers understood that a common education is one of the first requirements of neighborliness, that it tends to loosen the bonds of selfishness, and makes it easier for men to live together, to work and to play together.

That enormous progress has been made in general education in America is shown by the fact that in 1840 the total amount of education received by the average citizen during his entire lifetime was 208 days. According to present standards, this nation, educationally speaking, was in 1840, a low second-grade nation. By 1870, the total amount of schooling received by the average citizen had been increased to 582 days. We had reached a new level—the level of a high third grade.

To-day the average citizen receives a little over 1,200 days of schooling. We are now a high sixth- or a low seventh-grade nation.

Why this change? Because the problems of each succeeding generation have been more difficult than those of the preceding generation. Furthermore, the problems have grown more political, social, and spiritual in character. Our forefathers two generations ago understood that social and political problems are not altogether economic, but that they are also intellectual and spiritual. To them a carpenter was not a carpenter merely, but a citizen as well. The working man has long suspected that the man who knows possesses some secret influence or power that is being denied the worker. Some thought that power was money, and consequently sought high wages. Others thought it was political prestige and consequently sought political preferment. But most of them have learned that the secret lies in education. As a result the doors of the schools have been opened to the children of men on every economic level. Every time any class has secured greater political rights, it has demanded more education, and it has always secured it. The constant shifting of education to lower economic levels epitomizes the struggle of the race for human freedom. It is this struggle of the masses to secure an education, combined with their ability to profit by and to use it intelligently that gives us confidence in the ultimate outcome and integrity of democracy. Every one recognizes that such education is expensive, but the expense is insignificant in comparison with the enormous gain society receives from it.

The period during which the common school system was developed throughout the nation was the period

between 1840 to 1870. Much of the secondary education was provided in private schools, generally known as seminaries or academies. Gradually since then these private schools have been superseded by the public high school. This change came partly because the whole social organism was increasing in complexity and its problems in intricacy and variety. The population was growing rapidly. Thousands upon thousands of foreigners were passing through the immigration gates. Lines of communication were multiplying. Newspapers and books were more easily available. Acute problems of social and industrial expansion remained unsolved. The dark days of reconstruction dragged on. Although there seemed to be good ground for discouragement, the men of that day did not regard the situation as hopeless. Their idealism did not become distorted, nor did they lose faith in their institutions. They did what every generation of patriots has done—they made way for liberty by providing more education. High-school education, available to the children of all men, became their goal. They sacrificed that the next generation might have a better intellectual equipment than they had had. Right in the midst of this period of great economic and spiritual depression the University of Minnesota was founded.

Such is the history of all human progress. Each succeeding generation profits by the sacrifices of the preceding generation. These sacrifices always point in the direction of greater service to mankind. All too frequently do we forget that there is human ethics in human progress, that the comforts we enjoy, the satisfactions we have, the privileges we possess, all came because men who received but a few days of schooling during their lifetime were willing to pay a heavy price

for us. There is a moral in this for the present generation which I shall not press.

Long before the high school became an integral part of the established school system, many of the states created universities, which in the course of time, articulated with the public schools, and became a part of these. There are still a few skeptics who maintain that a state university should be separate and independent of the public schools. They would locate it on some Mount Olympus or sequester it in some secret place far from the sordid marts of trade, or the buzzing confusion of social and political worlds. Scholarship, according to their opinion, should not be contaminated by contact with the activities of everyday life. A wall with a wide and deep moat should separate the university from the high school, and only the very elect, the superlatively gifted, should be permitted to cross the bridge and to enter the gate. This is the philosophy of other days. The philosophy of to-day points to a system of state-supported public education, beginning with the lowest primary grade and extending to the senior year of the university, equally open to all who are competent to profit by it. This philosophy is the foundation rock upon which the entire superstructure of our democratic government rests. Destroy it, and democracy will fall. Cling to it, and democracy will survive.

The early state universities were modest in their claims. They were what Dr. Folwell would call "good schools." A varied curriculum was not required. Many of the instructors were great teachers. They enjoyed intimate personal relations with their students. The students were accepted as a part of the community. Student life was conducive to good scholarship. Those were the days when great personalities cast their

shadows far into the future. A few distinguished leaders like Dr. Folwell and Dr. Northrop caught a vision of what universities were to become. These empire builders saw the institution over which they presided growing in size and in influence. New courses were introduced, the curricula were revised and expanded; more instructors were secured; the contact between students and staff became less intimate. From an institutional point of view these changes brought both gains and losses. With the influx of students, dormitories began to be substituted for homes, convocations for chapel, a more varied and flexible curriculum for the simpler and inelastic ones, student service buildings for boarding clubs, and a more highly specialized staff has taken the place of the one of varied attainments.

To some extent personality has given way to institutionality. By this I do not mean that personality no longer plays a prominent part in the education of university students. On the contrary, it is just as important as it ever was. There is no substitute for it. But it is obvious that the head of a university like Minnesota can no longer know personally all or nearly all of his students. Something has been lost because these warm, intimate, and almost confidential relations which he once enjoyed with his students are no longer possible. But as I have already indicated, every loss has its compensating gain. The president, with his small faculty, has been supplemented by a large faculty; the influence of a few by the influence of many; a few points of contact by many points of contact. Considered from this angle, the most important university task is that of securing a high-minded, right-minded faculty. What members of the faculty think and believe, what they feel and express, to a greater or less extent, transfers across and

finds expression in the life and thought of the student body. Both individually and collectively the faculty should be imbued with an impelling desire to search for and to discover truth. It should be dominated by a reverence for the truth, a high respect for facts, and be saturated with human purposes and common human feelings.

A univeristy is a community of scholars; it breathes the spirit of the social order; it is constantly engaged in an attempt to understand the meaning of the age; it inculcates the craft spirit of the professions; it molds character. Every member of a university is a locus of influence. The individual professor still has limitless opportunities to make an impression upon his students. He must play his part; he must accept and express in his daily life the sacred obligation of his profession if the university in every respect would serve its true purpose. He must assist by every act in building that subtle, pervasive, and irresistible force which can be best described by the term " the institutionality of the university." Its constituent elements are the attitudes, the standards, the ideals, and the traditions of the institution. A university is not an aggregation of individuals merely; it has its social mind, to which every individual contributes. The social mind of a university is not lifeless and inert; it is a powerful dynamic, touching the life of faculty and student at every turn. Every stimulus that beats in upon the consciousness of an individual, influences him for good or ill. Consequently, none but the best influences should prevail in a university. The development of a genuinely wholesome institutionality through the personnel of a high-minded faculty, and the associated life of students and faculty in classrooms, libraries, laboratories, commons, union

buildings, auditoriums, stadiums, is the supremely important problem of a modern university. The primary factor of institutionality in a university is studentship; but a university is no longer a school merely. It is a republic of minds, dedicated to the dispassionate consideration of the problems of life and dominated by a wholesome philosophy of helpfulness and mutual good faith. Just as the largest achievement of an individual is himself, so the largest achievement of a university is itself. It makes its own soul,—a soul that resides in the best thoughts, the best feelings, and the best conduct of every one connected with it, and, in the attitude toward it of the community in which it is located.

It is a platitude to declare that the primary purpose of a university is to educate, and yet even this platitude needs to be reiterated now and then. Students come to it to master the arts and sciences, to prepare for the professions, or to advance knowledge. The college of liberal arts is presumed to provide that type of liberal training which is necessary for the exercise of intelligent citizenship and a noble use of one's leisure. If one graduates from a university with a love of literature, with the proper standards for evaluating social and political life, if he masters more than one language, if he is equipped to explore new territory in the fields of mathematics or the sciences, it is because of the instruction he has received in the college of liberal arts. The college of arts needs no justification; it is the basic college of the university. But it does not exist independent of the other units of the university. Indeed, one of the largest services it renders is the work it does for the other units of the university. Even doctors, dentists, and engineers must be taught English and sometimes physics and chemistry or a foreign language. The college

provides this training, and in doing so helps to integrate the institution.

Contact with the professional schools has modified the curriculum of the arts college so that much of its work is of a vocational nature. It is true that other forces have tended to produce this same result. The bachelor of arts degree, first given as evidence that one was qualified to teach, later in some American institutions assumed to be the insignia of a liberally educated person, is now granted for all sorts of cultural and special lines of work. Special significance is seldom any longer attached to the degree, but special significance does lie in the fact that the variety of things for which it is given is an indication of the efforts of colleges to liberalize themselves. They have acquired a new meaning and have been touched by a new spirit.

The professional schools have added another element to university life. One studies law to become a lawyer; medicine to become a doctor; engineering to become an engineer. In every case the student has definitely chosen his career. The mere presence of these students in the university means that old apprenticeship forms of training are no longer adequate. The science of the various professions has so far developed and the knowledge has grown so fast that from four to six years is necessary to train one for his profession.

The expansion and differentiation of universities into special schools and the large number of students electing professional training has caused to be raised the question of whether the state can and should continue to pay for this type of training. Should the state force the total cost of training entirely upon the students, it would mean that many of the ablest minds would be denied the privilege of being trained for the

various professions. No one would have the temerity to maintain that the best ability is always lodged with those classes that are able to pay the total cost of education. Ability is distributed without reference to the social or economic classes or stations. If life is to be made safe, happiness to be promoted, wealth to be increased, citizenship made more secure through study for the professions, then every possible means should be taken to attract the ablest minds to the professions, irrespective of the station from which they come.

It is also claimed that the professional schools do not train enough technicians for the profession,—that they are unduly interested in training men for leadership. We may need more mechanics or technicians in the profession, but the day is long since past when we will be satisfied with technicians when exceptionally important questions are being considered. We demand professional engineers, trained lawyers, expert dentists, skilled physicians. None other will satisfy. If state universities fail to provide such training, leadership in the profession will pass entirely to the privately endowed schools. This should not come to pass. If it does, professional practice within the states will suffer and the science of the professions will be seriously retarded.

The recent growth of state universities has been responsible for another criticism. There are those who fear that too many may be seeking a higher education and that when they have secured it they will not be willing to do their fair share of the work of the world. This is a result which I do not fear. I believe that the educated person will do his share of the work of the world, and that he will do it better because he has an education. The fact that one has an education does not

mean that he will not love to farm, to build houses, to work in the mines, the shops, or the factory. We need more educated persons doing these things.

Furthermore, education offers the only real solution for many of the most acute political and social questions with which we are confronted. Much of the peril of the present situation is due to ignorance. If the universities do not provide sound training on such questions, we may be certain that training will be provided elsewhere. It is not less but more thoroughly sound, impersonal, scientific study of such questions that is needed.

The graduate schools, since their establishment, have been devoted to the advancement of learning. This is dependent upon the ability and initiative of the student. Many of the graduate schools in recent years have somewhat lost the tradition that they are places for the advancement of learning, because they have taken on new functions. For a number of years, they have really been schools for the preparation of teachers for college. In becoming such, they fulfilled a real purpose and responded to a real need, but the advancement of learning for its own sake has suffered in consequence. Graduate students once associated as groups of scholars. They indulge in the free discussion of their common problems and current questions, but when graduate schools turned their attention to the training of teachers this common scholarly interest for all graduate students was lost. They ceased to assemble as a body and frequently as groups. Learning for its own sake no longer stimulated them. The only common bond they had was the fact that they were registered in the same school. Instead of becoming scholars in possession of a widely related body of knowledge, they became specialists upon some narrow phase of it. Such

persons are not likely ever to become great scholars. The great contributions to knowledge have always been the product of great scholars. Great scholars are not made by students working in small compartments of knowledge. Kindredness of mind, liberalism of spirit, wholesomeness of philosophy result from contact with large fields of integrated knowledge. A tradition of learning we must have. Without it the graduate schools will cease to be a place where learning is loved. Without it science will not advance, learning will disintegrate, and there will be no steadying force in civilization.

Several other forces have contributed to the partial breakdown of the tradition of learning. One has been the advent and growth of the indiscriminate elective system, which happily has seen its best days. Another cause that has worked to the same end has been the specialization of function in the professions. In place of the general practitioner of medicine, we have a specialist upon some disease, or upon some part of the human anatomy. Instead of a general course in engineering, we have special courses, in mechanical, civil, chemical, mining, hydraulic, highway engineering. Business, once a trade, is becoming a profession with its lines of special service. Every large establishment has its expert advertiser, buyer, credit man, sales chief, accountant, and business manager. Every bank has its expert on insurance, income, and profits tax. All of these differentiations are reflected in university administration. Combined with the other forces at work, the university faces the danger of graduating its students with what some have called " split and partial minds, students whose intellectual attitudes are undisciplined and extemporaneous." It is patent to the

student of education that the whole field of knowledge has been divided so frequently for the purpose of creating separate subjects to meet assumed needs, that a thoroughly sound education may be denied many students. The splitting of the materials of education into a multiplicity of subjects results in an over-emphasis of the materials occurring within a given field, and necessarily leaves the student with a fragmentary conception of nearly every field. Universities need to make a rigorous study of the materials of education. Nothing would pay larger dividends than for faculties to become students, both of the art of teaching and of the materials of instruction. University teachers have never seriously attempted to do this. Many teachers in America are more interested in discussing administrative devices, ways of securing recognition in the administration of their institutions, and the rules and policies of educational organizations, than they are in becoming better classroom workers.

When credit and hours and wages and recognition are the main themes of a body of teachers, we may be certain that their idealism has been colored and tinctured by the industrialism of the times, rather than by the professionalism of their calling. Just as many teachers are disposed to emphasize questions and problems that lie at the periphery of their realm, so many students think in terms of credits', hours', semesters', and years' work, and the result is that thoroughness of scholarship is in danger of being neglected. If there be any truth or justice in this criticism, it can not be held to apply with equal force to all units of the university at all times. Wide variation at any given time exists with respect to the completeness with which the various units of the university fulfill their functions.

Each unit should periodically inventory its organization and evaluate the results it is securing. It should see if it is making its specific contribution to the education of the students in the most effective manner possible.

But even though weakness may exist here and there, the mass results of the university are encouraging. There are certain ideals, there is a certain tone, there is a certain atmosphere characterizing the life of a university that distinguishes it from every other human institution. Whatever those ideals, that tone or atmosphere may be, it is as truly a function of the university to foster, conserve, safeguard, and stimulate it as it is a function of the university to provide instruction of a specific and definite character. Both make their impacts upon the student. Perhaps the most important of these general functions is the catholicity of spirit the university seeks to inculcate on all occasions. A truly educated man will be, to a certain extent, a cosmopolite. He will be a student of the problems of other nations. He will recognize that his own nation can not maintain permanently an attitude of singular insularity. The loyalty of an educated man to his own country will not blind him to his obligations as a citizen of the world, nor will he be led astray by local and ephemeral interests. The philosophy he cherishes for himself he will wish to extend to the rest of the world.

What is that philosophy? What does the truly educated American believe in? He believes that his institutions are social in origin and in nature, not the product of any individual, nor of any special group of individuals, that they represent the soul-hunger and the spiritual expressions of the common people. He

believes that the only natural rights any one has are those that he uses for collective welfare. He believes in equal rights before the law. He believes in equality of opportunity. He believes that potentially the achievement of the individual is measureless. He believes that a generous education for himself and a better one for his children is the only safeguard of democracy. These are the priceless possessions of his creed, the articles of his faith which he desires to have transmitted and made available for mankind everywhere.

It seems strange that it should be necessary to emphasize these truths at this time, when the average man has had his vision widened by the world war. The culture, problems, and interests of other nations are a part of his daily thought. The effect of the individual's reaction to these problems and interests is educational, but the unfortunate truth nevertheless remains that some think patriotism means my country *against* the world, instead of *for* and *with* the world. Traditionally, we may be narrowly nationalistic, but educationally, economically, and politically, this country is a member of the congeries of nations. Our Christian ethics teach us to be our brothers' keepers, and the golden rule commands us to do unto others as we would have them do unto us. Any individual who thinks of his job primarily in terms of the money he can earn from it, any one who thinks of a profession in terms of personal gain, any nation that thinks that its problems lie almost entirely within its own boundaries, is on the road to self-destruction. The ancient dividing line between the Old World and the New has disappeared. America can not retain a detached position. The logic of events is demonstrating the utter helplessness and hopelessness of those who cling to such a deluded point

of view. Americanism means that we can not disassociate ourselves from our interests, and our interests require that Europe be lifted out of the mire and restored to life and prosperity.

A university does not engage in propaganda, but its very atmosphere breathes of the spirit of helpfulness and of interest in the problems of men everywhere. Its graduates should live in a republic of minds that knows no limitations of time and no geographical boundaries. If this concept seems ideal it is none the less important for that reason. When a university ceases to be saturated with high-minded cosmopolitanism, a spirit of mutual helpfulness, and a desire to know and to understand the problems of the world, it will cease to be a university. When it gathers under its cloak a spurious cosmopolitanism whose insidious intent is destruction, it becomes a menace to social welfare. This great aim, this fundamental purpose of a true university we must constantly proclaim from the housetop, that we do not lose sight of it.

Another of the general functions of the university, quite as important as the development of a generous, intelligent, and discriminating spirit of cosmopolitanism, is that of service to the community or state in which the university is located. Perhaps one would say that has always been its purpose and that it has been realized only as universities have sent back to the community or the state efficient graduates. And this statement, of course, is correct. The final measure of value of a university is the kind of service its graduates render. Both the university and its graduates underwrite each other. If either declines in merit or worth to the community, the other declines; if either grows stronger and

better and serves more nobly, the other improves correspondingly.

There is another way in which a university may serve the community, and that is by assisting it in solving its problems. If the state wishes to know how to beneficiate certain ores, how to eradicate wheat rust, to determine the economic value of peat, to discover the best methods of extracting syrup from cornstalks, how to build roads, how to harness its water, how to eliminate the white pine blister, it will apply to the university for assistance. I foresee a time when state law schools will collaborate with the judiciary in the codification of the laws and in the preparation of legal materials required for the preparation of opinions or decisions. I predict that sooner or later there will be erected as a part of our engineering schools institutes of research to which all sorts of practical engineering problems will be brought by the state and by corporations and individuals. It is said that a little less than $100,000,000 a year is now spent on engineering problems in private laboratories. The prodigality of this will be recognized eventually and a coöperative arrangement will be entered into with the universities to do much of this work. When this comes true, men of science will not be taken away from institutions of learning, but will be urged to remain by the very organizations and people that are now taking them away. I believe that schools of commerce and business will find a corresponding service and that their advanced work will be largely financed by the special projects which they receive from the manufacturing and mercantile establishments of the community.

The principles which will govern the contact of the university with the community will not differ in a single

respect from the principles that govern that contact now. The university will refuse to become commercialized. It will not sell itself. It will accept only those projects that have an educational value. It will insist upon the right to publish the results of its researches, and business, whether corporate or individual, will gladly consent to that right.

Every school and college of the university will find larger opportunities for community serviceableness in the future. The school of medicine will enjoy the respect of the medical practitioner. It will bear to the practitioner the same relation as consultant that he bears to another physician. The state will locate general hospitals at the university to which patients will be sent from every section of the state for care and treatment. As health education becomes more universal, community and private hospitals will increase in number. Affiliations between them and the general hospital will be arranged to the mutual advantage of both and to the very great advantage of the people of the state.

There is one other service which the university should perform and that is the publication of the results of their investigation and researches, particularly those that have a practical bearing upon the practical problems of the community. Many of these investigations are written in highly technical language and are filed away for safe keeping in the archives of the university. They will need to be rewritten in a language suitable for popular consumption and widely distributed to those who may profit by them. There is enough material of this sort filed away in universities to produce important if not radical changes in many fields.

As one contemplates the conception of university education as outlined in this paper, he is impressed with its enormous possibilities. He comes to the inevitable conclusion that the great objectives of life will always be reflected in the curricula of the university. Just now these objectives seem to be intelligent citizenship economic betterment, social and individual justice, and health. Furthermore, the university of the future will be the one best place in all the world for intellectual training, for a mastery of the technique of the profession and the instruments of inquiry and research. It will be a place where men will learn to think in terms of larger units and more abiding forms of service. Those who think otherwise are not cognizant of the tremendous currents of social evolution that are fairly seething about them. The state university of the future will never return to the simpler theories and practices of earlier days, and yet it will exalt scholarship as truly as it was exalted in those days. The university of tomorrow will have a social vision as well as an effective kind of individualism. It will be dedicated to the making of a better world to live in. It will not neglect its duty as a guardian of the treasures of civilization nor as a pioneer on the outskirts of knowledge. But it will acquire a new breadth of interests and sympathies, outlooks, intellectual tastes, and appreciations in harmony with the age it lives in and to which it owes its being.

THE UNIVERSITY AND THE DEVELOPMENT OF AGRICULTURE

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THERE is nothing more pathetic in the history of education than the early attempts of institutions to comply with the conditions of the Morrill Act as it was understood in the early seventies and eighties of the last century, unless it be the pristine efforts of psychologists to drag their subject from the "science of the soul" to the higher land of a real analysis of human functions. Without any guide, for there was no science of agriculture, the early builders of these institutions established schools in imitation of those already existing and set up courses of study that were closely akin to the secondary schools of the time. In order to impress the public with numbers the emphasis was laid upon the type of school that would draw numbers. Content with this view of their functions the agricultural colleges of the land for the first twenty years of their history drifted along with little or no instructions in the field of agriculture as we know it to-day.

With an occasional exception, the great patrimonies of public land were sold for a mere song and the proceeds filtered away in the construction of ugly buildings devoted to the housing of departments of language, mathematics, and the other highly respected subjects of the old-fashioned curriculum. The teacher of ag-

riculture was faced with a difficult task since science failed to provide him with the data required for satisfactory instruction.

The establishment of the experiment stations in 1887 had an immediate influence in widening the vision and adding new content to the courses in biology, physics, and chemistry. The reaction of their work upon the teaching in these institutions was very marked coming as it did when the central west was passing from a small grain agriculture to diversified crops and animal husbandry. Nevertheless it required time to enlarge courses of study and bring the standards of teaching up to a college basis, let alone a university conception. In consequence it has been a matter of barely twenty years that the university idea of research has found its way into agricultural instruction. Meantime agriculture as a great industry has forged ahead bringing problems to the state universities faster than they were able to solve them. So rapidly has this movement gone on that it threatens to outrun the financial and administrative capacity of the state universities and agricultural colleges to deal with it. Meantime the rural delivery, the consolidated school, and the agricultural press have raised the standard of country life and created a great clientele among the farmers of the land that may safely be counted as more progressive and intelligent than any other industrial group. This in itself widens the problem and forces upon the state university and agricultural college the necessity of really doing research and giving instruction of an unusually high character to meet the needs of the people. Within the memory of all of us agriculture has passed from a political status into an industrial one demanding business organization and careful statement and application of

scientific principles. That such an evolution should have taken place in so short a time, now that we review it from present day vantage ground was to have been expected. Looking forward twenty-five years the university can not have the same excuse for failing to meet the situation. If the body of scientific principles then known could have been applied twenty-five years before they were, the advance in national prosperity would have been almost unbelievable. It appears then that the obligations of the university to the fundamental industry of agriculture are very great, necessitating the application of vision, courage, and knowledge to the problems of to-day.

It is no longer necessary to insist that agriculture is the foundation upon which rests the welfare of a great industrial people. That statement is accepted though it might be well to emblazon on college walls the words of Daniel Webster to the effect:

> The cultivation of the earth is the most important labor of man.
>
> Unstable is the future of a country which has lost its taste for agriculture. If there is one lesson of history that is unmistakable, it is that national strength lies very near the soil.

Such statements do not solve the problem of the university's relation to agriculture, they only tend to bring it out in greater contrast. The time has come, however, for the administrative bodies of the state universities to grasp the full meaning of Daniel Webster's comment. That they have not, I think can be fairly well demonstrated. With a very few exceptions the agricultural college is a somewhat isolated part of a university organization. The emphasis upon the need of expanding professions has brought many problems to the universities in the form of greater plant, new schools of law,

medicine, engineering, and education, while the constantly growing student bodies have clogged the machinery of administration and directed the attention of university heads to housing, welfare, and construction, to the possible neglect of agriculture. In saying this it is not to be understood that no progress has been made, but rather that the emphasis upon the growth of agricultural courses and investigations has not kept pace with the growth of the industry or of the universities themselves.

I will not go so far as to say there is a crisis in agricultural instruction to-day, but I would insist that we are very close to a period of depression if not actually in it. By that I mean the universities are not keeping pace with the needs of the industry in the presentation of scientific data and the teaching of principles. An inquiry among those best informed on the status of agricultural extension will disclose the somewhat general impression that agricultural extension has slowed down all over the country. While good results are being obtained they are not fully commensurate with the time or money expended. This condition is due first to the tact of well-trained men to fill the positions created by the Smith-Lever Act and second to the absence of scientific data needed to supplement the work in the extension field. The informational course of instruction has all but spent itself and the extension worker finds that he needs scientific data of a specific character if he is to carry the interest of the farmer.

Both the training of men and the explanation and accumulation of scientific data are university functions of the highest order. The first of these requires a staff of able teachers, highly trained and thoroughly acquainted with modern problems. Such staffs are a

rarity due to the drawing of able men into government and managerial positions at salaries higher than the universities pay. The result is a dearth of men for the positions in agricultural teaching including the extension field. The second, the accumulation of scientific data, is quite as serious. It was the intent of the Hatch Act to make the experiment station research organizations capable in their staff and equipment of dealing with agricultural problems in a really scientific way. Much valuable work has been done by the stations and is being carried on by them to-day, nevertheless there is a gradual dropping back in agricultural research among the agricultural experiment stations. This disturbing condition is due to insufficient support. Up to 1914 the states increased the funds so appropriated to meet the Federal appropriations, but since then the states have not increased the aggregate amount despite the difference in purchasing power between the dollar of 1914 and 1920. This failure to appropriate for the stations may be accounted for in the new demands upon state legislatures through the Smith-Lever Act, vocational education, and the Federal roads expenditures. It appears to be the old story of the hide, that there is just so much of it and when used for shoes it can't be made into coats to keep out the wind.

There is another incubus resting upon the station and its work in the form of police and regulatory duties that take the time and energy of directing officers. Many of the stations look after the regulations of seeds, feeds, fertilizers, drugs, the licensing of creameries, the keepers of bees, the planters of orchards, and the sale of nursery stock. All of these are things worth doing, but when saddled on a research institution they act as an Old Man of the Sea on the back of Sindbad the Sailor. The list

is not completed with this recital. On the other hand the agricultural colleges so closely associated with the stations find that the station men can be used for teaching oftentimes more extensively than is desirable for the best work in the college or the station. So the research work is hemmed in by lack of funds, regulatory and police duties, and teaching functions. Thus the source of agricultural information is clogged and the whole system of instruction is affected by the conditions existing in the research field.

Nor am I certain that agricultural education is received into the full fellowship of the university faculties. This is not intentional, but due to a failure to appreciate the problems of agriculture and the feeling that it so strongly emphasizes the practical that the proponents of the subject lose sight of the principles of science. Certainly agriculture must have all that physics, chemistry, and biology can contribute if it is to meet the problems with which it is confronted to-day. It needs, however, the sympathetic appreciation of its difficulties by the chemist, physicist, and biologist and the willingness on their part to assist specifically in the work of instruction from the agricultural point of view.

It is not to be argued from this statement that the agricultural college would do better with the problem if organized separately. I am sure the history of agricultural education has demonstrated the error of that view. Agriculture as a science and as an industry needs the university idea applied to its problems with sympathy and vision.

With this statement of the situation within the university we may turn to the agricultural conditions in general. I have already called attention to the existence of a highly intelligent farming population, intent

on the whole, in bettering their condition and improving the industry. The change in world markets since the signing of the armistice has intensified the economic situation and made the farmer keener than ever to secure an adequate and satisfactory market for his products. He is turning now to real business proposals based upon sound principles for relief in a highly difficult situation. Political devices have been found wanting. He is anxious to secure the benefit of the advice and help of trained economists who can direct him in the organization of the sales side of his business. He has learned that the local efforts to suppress production have no bearing on the markets of world products like those of agriculture, hence the farmer of to-day is calling for leadership, organization, and information that will make it possible to create for agriculture a modern industry replete with banking, marketing, and transportation facilities. The problem is enormous, but it must be solved if the country is to rest upon a sound industrial basis.

Other problems are pressing for solution in addition to the great one of market organization. The perishable products of the farm are too often lost by lack of transportation and delay in harvesting due to weather conditions. Such losses spell disaster but dehydration or distillation with comparatively little difficulty might be used to save food products or utilize damaged crops for the manufacture of spirits. Again the destruction of animal parasites would be a boon to the cattle industry, but little progress has been made in this direction. There is likewise a great need for new light on the problems of breeding, but the animal husbandry experts stand in about the same place that they occupied fifteen years ago. All of these matters are really

laboratory questions to be worked out by careful research methods requiring the university point of view.

Perhaps no other effort would bring as great results as the issuance of information at regular intervals on the supply and prices of agricultural products. The government has established bureaus of information that send out the news regarding the condition of certain crops, but the farming industry is not well equipped with price information. The consequence is that the farmer acts on meager news or instinct, and fails to get the results that the better organized and equipped manufacturer and business man secure. In most industries, brands and standards are well established, but outside of wheat and cotton this is not the case in the sale of agricultural products. In the South a great discussion went on during the fall months with the purpose of securing coöperative action in cutting down the acreage of tobacco. But no agreement was reached partly due to distrust and partly to the need of a money crop. Since then the discussion has turned to better grading and marketing methods for tobacco. Progress in the matter is hampered by the lack of information and extensive knowledge of the tobacco industry. A solution can be worked out and probably will be, but it is necessary to have the coöperation of economists, botanists and plant experts, the press, the farmers, and the buyers of tobacco. What I am trying to intimate is that the university has in this problem, as well as in others, a real duty to supply the technical knowledge. Foresight on the part of the universities of the states where tobacco is raised would have provided this information when it was needed, but the very restrictions upon experiment stations in the lack of funds and extraordinary duties in many fields have acted as checks in

the presentation of the information now so greatly valued.

It appears then, that agriculture can not be developed through short periods of time, the problem of the industry is a long-time one extending over decades rather than years. The work which has been done is largely in the nature of marking out short-period problems. In fact most of the research now carried on in the universities is conducted by the laboratory man who has set himself a definite narrow problem that touches only the fringe of agriculture. This procedure is undoubtedly necessary, but the larger aspects of agriculture as a whole must be grasped by the university and the research conducted as a whole and not by the piecemeal plan. Without doubt the future development of agriculture depends upon the sympathetic connection of the university in organizing the scientific work as a group problem. It is not meant that the university shall take over agriculture, or conduct the business side of agriculture, but it must provide the scientific data for its uses and at the time when it is needed. In no other industry is there so clearly the application of the idea of a state-wide campus as to agriculture. Agriculture is in a constant flux, it never stands still. The soil changes with every crop, the population moves and shifts as the agricultural basis of national life is modified. The university must ever be on the alert to ascertain the changes in the application of nature to this great industry, and to bring to bear the resources of its departments of botany, physics, chemistry, biology, economics, and history so that in reality the state is the campus of the university. Such a result can not be attained by the present method of individual effort here and there in the laboratory. The industry must be

taken as a whole, its needs studied and the research definitely organized to meet, first, the immediate requirements of the demonstration agents in the field and the content of course of study in the college, and second, to develop genuine research in unknown fields that will anticipate the requirements of knowledge in the future.

The University of Minnesota was a pioneer in agricultural instruction and research. The work of men like Hays, Green, Snyder, Haecker, and Boss was outstanding in plant-breeding, creating of new varieties, and development of the creamery industry. Meantime other institutions have come abreast of Minnesota and the agricultural college does not stand out as it did in the earlier days. It is not part of my function as a participant in this program to tell why this is so, but the probabilities are that the same forces that have restricted research and investigation elsewhere have done the same thing here. The whole country has been so busy with extension that research has been neglected. Accumulated knowledge was drawn upon and the new sources were not kept up. There rests upon the university the very clear duty to restore the experiment station to its real function, to enlarge its vision of the great service that can be rendered to agriculture, raise the instruction to higher efficiency, and recognize that the training of men for this field is one of the greatest functions it can undertake.

THE UNIVERSITY AND PROFESSIONAL TRAINING

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The problem of professional training is to-day the most important problem in the administration of American universities. Reckoned in terms of cost, or of equipment necessary, or of students and teachers engaged, there is no other feature of university work so prominent. Indeed, if student population continues to increase at anything like the ratio of increase experienced in the last decade, the time is surely coming when some of our universities—particularly state universities—will be exclusively devoted to professional training and to the prosecution of research—itself a highly specialized form of professional training. The academic instruction now given in the freshman and sophomore years will be relegated to junior colleges, as is now being done in California, where the state university is overcrowded. Even a short look ahead justifies special consideration of the nature and extent of professional training in the future development of the university.

What is professional training? Let me say at the outset that I do not regard it as anything esoteric. It is merely a device to shorten the period of apprenticeship undertaken by every learner who would acquire the knowledge and skill possessed by the leaders in his field. It is a means of carrying the novice over the road already trod by his masters, and of saving him from some of the dangers that lurk in his way. Its

highest aim is attained when, in addition to the modicum of knowledge and technical skill required for admission to the profession, the young practitioner goes forth with unselfish ideals of service and a mental equipment that impels him to develop his own professional strength.

The aim of the professional school is to fit its graduates to give expert service in a society that feels its need of technical skill and is willing to pay for it. The world buys products of human labor, but what it really pays for is the technical skill of the worker. And back of technical skill lie specialized knowledge and the fine art of using it properly. Indeed, the only difference between the artisan who repeats a thousand times an hour the same clever trick of manipulation and the operative skill of the great surgeon, lies in the extent of knowledge focused on their tasks and the ideals that inspire the workers. Both workers may have skill of the highest order, but in the one the center of control is the spinal cord; in the other a higher center takes charge. Specialized knowledge, high ideals, technical skill—these three are the trinity of professional guidance.

It follows, therefore, that a professional school should set up three dominant ends to aim at. In its curriculum it should strive to organize and systematize the knowledge available in its particular field so that its students may get the essential facts needed at the beginning of their career; in its teaching it should give inspiration to creative effort and altruistic service; and at some stage of its training provision must be made for gaining technical skill. The pedagogical problems of all professional schools grow out of these three fundamental requisites. These factors, however, are all

variable quantities. A professional school may be acceptable in general and yet be weak in one or more of these essentials. The ideals that guide the faculty may be rightly conceived, and yet fail to function in the lives of students and graduates. The knowledge gained in course may be defective because of lack of scholarship on the part of instructors, want of diligence in or through bad teaching. Technical skill may be purchased at too great a cost, or neglected to the point of leaving graduates helpless on entering their vocational employment. Right proportion in the adjustment of these essentials is the crux of administration in every type of professional school.

Consider first the problem of the curriculum. The professional student is not concerned with science in general, or philosophy in general, or anything else in general. His needs are very specific. He is given absurdly short time to get the information that scholars and masters of his subject have been collecting for centuries. His task is to select what is usable, to rearrange and classify it, to order it in such a way that principles shall emerge which may guide him to new knowledge or direct his practice. The whole process of education hitherto experienced is now reversed. Instead of getting a liberal education that aims to develop the *man* through the culture and discipline of academic studies, the professional student finds himself in a situation that demands he focus all his strength on making himself an intelligent, conscientious, efficient, technical *worker*. There is no room for academic instruction in a professional curriculum once professional training really begins. The mental attitude of the student precludes the possibility of success, and the needs of the profession make it impracticable. No

professional curriculum gives half as much as is available in any professional field, nor half as much as the practitioner in any particular field can profitably use. Unless the liberal education acquired before professional training begins is dynamic and continues to function in making the man, there is small chance of further development under professional training. On the other hand, an education that does not result in making a man good for something is an anomaly in this work-a-day world. Vocational training is the complement of academic training. It can never be a substitute for a liberal education, and it should never be confused either in aim, content, or method with academic training.

A part of our trouble comes from the organization of our university system and arises from the fact that students are admitted to professional schools poorly prepared for professional training. The lack of academic training in some essential subjects excuses the introduction into the professional curriculum of subjects that properly belong to the college. The consequence is that most of our professional curricula are partly academic. On the other hand, no American college that I know confines its students to instruction that has no bearing on their future vocation. More and more the American college caters in its later years to the professional interest of its students. This overlapping of the college and the professional school is peculiarly American; it is the natural outcome of our individualistic system of higher education.

From the standpoint of the professional school, the interlacing of academic and vocational courses has two serious consequences. First, it tends to shorten the period set apart for professional training, and in the second place it introduces into the professional school

academic standards and methods of instruction wholly foreign to the professional spirit.

The time that can be devoted to professional training is determined by hard economic facts. Theorizing on what the profession demands or what society should have by way of expert service plays a minor part. Society gets in the long run what it is willing to pay for. Professional workers, like other capitalists, are not inclined to increase their stock in trade beyond the point of satisfactory economic return. Fortunately, however, the professional worker is an idealist who counts as part of his reward the joy he finds in his work. But by and large expert service is balanced by a cash equivalent, the size of which predetermines the expertness of the service as measured by the time expended in getting it. Lengthening a professional course is not necessarily synonymous with raising standards. Passing the limit of satisfactory economic return inevitably tends to decrease the number of applicants or to lower the professional ability of those content to plod through a longer course. The curriculum may be lengthened upwards, therefore, only if the graduates can increase their income enough to warrant the increase of capital represented in their training. So long as only a few can profit from a lengthened curriculum, the device of a graduate professional course, as distinguished from research work, is the obvious way of meeting the situation.

The output of productive scholarship, increasing as it is every year in all professional fields, puts a heavy strain on professional teaching. Alert teachers find something new to add to their instruction every year. Some teachers in every faculty lack the ability to substitute the new for the old and go on teaching this year

what they taught last year. They invariably excuse themselves by an appeal to mental discipline, as though mental discipline could best be secured by presenting half-truths or irrelevant facts. Others add to an overcrowded course more and more material until their students succumb to mental dyspepsia. But, with the best of foresight, the inevitable tendency is toward an overcrowded curriculum, and its accompanying discomforts for both teachers and students.

Economy of time for the student and efficiency of teaching for the instructor are vital problems before every faculty. I suppose the only method of determining correct procedure is by trial and error. The trouble with most college faculties is that they make the trial without profiting from their errors. They don't bury their mistakes, as physicians do, but they do graduate them.

The introductory courses in most of our professional schools are the chief obstacles to lengthening the curriculum by extending it downwards. If they are really pre-professional, are they the best and most expeditious means of getting students ready for serious work in the several fields in which they specialize? The stock answer that these courses are well taught, that they are comprehensive, and that they afford excellent mental discipline, is beside the mark. Grant all that. The same can be said for scores of other courses—some of which would be of incomparably greater worth to the farmer or the engineer or the physician who may be asked to represent his constitutents on the county board or in the legislature, or who in his leisure hours wishes to read his daily paper intelligently and find pleasure in human affairs.

The fact is, I assume, that these so-called introductory courses are included in the curriculum, first, because they are preparatory to the later work, and second, because by university tradition (but more because of university poverty) they are regarded as fundamental. I am willing to grant that early in the course, preparation should be made for what is to follow; but every hour, from the time the student enters, is a preparation for all that comes after. Any line that may be drawn between general and special courses, or between pure and applied sciences, is purely artificial and arbitrary. The whims of academic teachers too often determine what introductory courses shall be given and how they shall be taught. Professional needs make way before the omniscience of academic specialists.

The opinion of specialists on matters outside their own field, however, is of no more consequence than the opinion of other good people. Indeed, it may be not quite so good, if their personal interests are involved. Nevertheless, interdepartmental courtesy is so prevalant in every college faculty with which I have been connected, that it becomes dangerous to question the judgment of a strong man entrenched behind the entanglements of his own specialty. The fact is, however, that there is no one course universally recognized in American colleges as the best introductory course in any department. And even if the topics treated appeared on paper to be the same, the personality of teachers and their selection of illustrations would differentiate their instruction. The choice of topics for such courses has been conditioned by the interests of teachers and the needs of students. The needs of investigators in the several fields have undoubtedly had first consideration, and next have come the needs of

students in the older professional schools. A new school, such as the school of agriculture or journalism or business, has a hard row to hoe and tardy acknowledgment of its rights.

Probably the strongest prop for the idiosyncrasies of collegiate heads of departments is the disposition of those who hold the purse strings to take the cheapest way. It undoubtedly costs less to give the same introductory courses for all students, at least during the formative period of university history; but there comes a time when the student enrollment in a particular school is large enough to justify special consideration. For example, it would not appreciably increase the cost of instruction in most of the science departments of a large university to give special introductory courses to students in the school of agriculture or engineering or medicine. If that were done intelligently, the selection of topics could be restricted to principles needed by the particular group of students, and all of the illustrations might have a direct bearing on the professional course. And the proper persons to decide what principles are needed and what illustrations are most serviceable, are those who have the professional understanding. The result would surely be a better preparation for professional work and a saving of student's time. Otherwise, I see no escape from an overcrowded curriculum, with the inevitable consequence of narrow specialization and bad teaching.

It may be too much to expect that the American professional school should so early burst the swaddling bands of its academic nurse. Our oldest university professional schools had their beginning scarcely more than fifty years ago, and thirty years ago the best medical school and the best law school in New York

City were really proprietary institutions. The foundations of agriculture and engineering were laid under stress of our Civil War, but the superstructure as we know it has been built in the last thirty years. These schools are all offshoots of the college, and the college supplied most of their early teachers. What wonder, then, that academic ideals of scholarship and academic methods of teaching found their way into the professional schools. The framework and nomenclature of the college still remain. We have departments and subjects of study and semesters and credits—all according to the strict letter of the academic law. And yet we know that a department in the academic sense exists for the development—not to say illimitable expansion—of a subject, even to the bankruptcy of the institutional purse. A professional school has no need of departments except for administrative convenience. It has no excuse for courses of set length or for credits measured in semester hours. It needs only a faculty, because a faculty as distinguished from a department in our university system exists to protect and further the interests of a particular group of students. Professional students demand that their instruction concern itself with the real work of life. Such a demand is perfectly legitimate, and no professional school can afford to ignore it. In fact, so far as I know, there is no other end worth working for in a professional school. We must rid ourselves of the notion that because an act or a process is simple or common, therefore it is unworthy of a place in a university school. The material of instruction in a professional school can not be measured by academic standards. The needs of the practitioner in his practice are the sole standards for determining what he should be taught. The binding of a wound or

the tying of an artery is not a superlative test of intelligence, but no medical school thinks of graduating a physician without giving that ability. The professional school must teach what the student needs and has not already learned.

A correlary to this proposition is that what the professional student needs should be taught in the most efficient way and in the shortest possible time. A professional school has no excuse for following academic tradition in giving courses all of the same length and mostly of the same credit. Graduates complain of padding in some courses given by academically minded teachers. How can it be otherwise, if an instructor must spread over a semester, three hours a week, what might be better done in one-third or one-fourth that time? I know the disposition of college faculties to look askance at courses that can be given in less than semester units. Some are sure to say that they are not of university grade. My reply is that such critics are not of professional grade; they are either academic or research teachers. And no professional school should be controlled either by an academic or a research faculty. The professional school that hesitates to teach what is needed by the practitioner in his practice, or to teach it adequately and in the shortest way, is headed toward the tail end of the procession.

It takes more nerve than I have to discuss the practical problems of methods of teaching in a university. One may have his suspicions of the procedure behind the closed doors of a college classroom, but only the students subjected to the ordeal are really in a position to judge. But students are not competent to pass judgment on a teacher's work except in an empirical way, by comparison with the work of other

teachers. The most serious obstacle to good workmanship in the teaching profession is the fact that the teacher rarely has a chance to measure himself with his equals. He deals only with his inferiors in point of intelligence, experience, and skill. What wonder, then, that some teachers fall into ruts, become intolerant of innovations, and resentful of criticism either from their students or colleagues?

There is, however, one general principle of teaching that should commend itself to every instructor in a professional school. Granted that no professional student can possibly get, in the time allowed for a professional course, all that he needs in his future career, it follows that the materials of instruction should be those of most practical service, and should be presented in such a way as to beget the clearest understanding of their use. Useful knowledge comes from facts carefully coördinated—done up in packages and labeled "principles." There is no one best method of doing anything in general, but there may be a best method for a particular worker under very particular conditions, to do a particular thing. The teacher who is alive to his responsibility, conscious of his faults, and ambitious to improve, will find a better way of doing his work with each succeeding class. The pity is that he should be willing to travel the path alone, giving pain to himself and doing injury to others, when so many of his predecessors and colleagues are competent to act as guides.

Intelligent workmanship is the final test of professional ability. High ideals and abounding knowledge will not save the practitioner from merited condemnation, if he fails in technical skill. Malpractice in medicine is not essentially different from incom-

petence in farm management. Such competence as is necessary to start the professional worker in the right way must come from practice under a master. Technical skill is established in habit. Bad habits are as easily acquired as good habits—and are far harder to break. The steps in habit formation are three: (1) the learner should know *what* he is expected to do; (2) he should be shown *how* to do it; and (3) he must be kept doing the right thing until it becomes automatic. The conscious effort of an intelligent learner aids powerfully in determining the proper procedure in a particular case, but only persistent practice can ever give the skill demanded of the successful practitioner.

Some professional schools, like law, medicine, and engineering, have a well-defined body of special knowledge which can be imparted to relatively young students. The business of such a school is to uphold its professional ideals and give competent instruction in professional subjects, leaving the acquisition of technical skill to come during a period of apprenticeship in an office, a hospital, or a shop under the eye of a master. In other professional schools, like teaching, journalism, and agriculture, the graduate must make good the first day on the job, at least have the ability to conceal his faults. Under such conditions, technical skill is at a premium. It is true, however, in every profession that technical skill is an asset which must be acquired, if not in course, then in the lower grades of professional service. How much should be given in the professional school is always determined by the conditions prevailing in the profession. The profession that expects its novice to stand on his feet when he graduates must teach him to walk while in school. It does not follow,

however, that a college graduate needs the same automatic precision in technical skill that the trade worker finds necessary. The lower the intelligence of the worker, the greater the need of training in habit; the higher the intelligence, the more can be left to self-direction. But every graduate of a professional school should have practice enough in doing the real work of his future vocation to make him conscious of his faults and to give him confidence in his ability to direct himself in the application of his knowledge. It is not a question of the necessity of practical work; that must be conceded. The real question is, how and when can it best be given? Given in one way, the college is reduced to the rank of a trade school; given in another way, it places the institution on the professional plane.

Professional training, as I have said, is merely a device to shorten the period of apprenticeship undertaken by every learner who would acquire the knowledge and skill possessed by the leaders in his field. The professional school teaches only a part of the game; it succeeds best when it induces its students to become learners during the rest of their lives. When it provides the minimum required of its graduates on entering their vocations, the rest of their instruction may safely deal with the reasons underlying their professional practice. These reasons are embodied in the specialized knowledge that I have characterized as an essential factor in professional training.

It is obvious that the reasons for a particular treatment can best be illustrated by reference to the act itself. It is the principle underlying all laboratory work, except when laboratory work is made an end in itself. The student who sees what happens to a soggy field is better able to appreciate the reasons for under-

drainage. A month in charge of a dairy herd will vitalize the teaching of the principles of feeding as nothing in books or lectures can do. The case system has revolutionized the study of law, and the appeal from the lecture and the textbook in medicine to the laboratory, the bedside, and the clinic has transformed the professional training of the physician. Hence, I maintain that success in teaching the principles of professional practice is conditioned by actual experience in the practice of the profession. Here, then, is where the professional school kills two birds with one stone. The ideal balance is obtained when enough practice is given to check up the theory, and enough theory to direct the practice aright. Disturb this balance by teaching theory as an end in itself, and you have an academic institution. Teach theory as reasons for practice, and you have the makings of a professional school. More can not be expected until teaching itself becomes a profession and its novices are subjected to the same rigorous training that the best professions now expect of their candidates. Meantime, there is only one unpardonable sin that a professional faculty is likely to commit, and that is the failure to uphold its own professional standards without fear or favor of academic tradition.

THE UNIVERSITY IN THE DEVELOPMENT OF CHARACTER AND CULTURE

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THE distinguishing characteristic of a university is its function of scientific research, but its fundamental service is that of developing character and culture. Specialized professional education and even the activities of research depend upon liberal or general training for much of their effectiveness. Unless breadth and thoroughness are the foundations of particularized knowledges and skills, these lose half their advantages. Even the more or less minute investigations of modern scientific inquiry are deprived of the protection of wholesome criticism when pursued by a mind narrowly and not liberally trained. The foundation of the university system is in liberal training—a training more concretely indicated to the layman as training for character and culture.

The fundamental nature of liberal training is clearly suggested by an analysis and classification of current lay criticisms of the higher educational system. Separating ignorant and unfair appraisals from sincere and legitimate estimates of university products, we find that fully nine tenths of the strictures on scientific investigators and professional practitioners trained by universities are criticisms of defects which a sound liberal training or discipline should have made impossible in scholar, lawyer, doctor, journalist, engineer, or

other intellectual specialist. They embrace defective attitudes and methods in work, lack of breadth in information and resourcefulness, inadequate sense of relative values, and poverty of imagination in self-criticism. These necessary accompaniments of specialized knowledge and skill are indicated as lacking nine times where criticism of specific masteries occurs once.

It is obvious that we must turn our attention to the whole conception of liberal education as now applied in the collegiate departments of our universities. It becomes a serious basic problem in the improvement of universities. Without improvement at this one strategic place, the development of research and professional training will be sadly hampered.

By such a statement I do not mean to imply that the graduate and professional schools can shift the entire responsibility to the college of liberal arts and forget it. That is precisely what they are doing—and it is just what they can not continue to do. These special schools have a right to expect a certain character and culture in the students they receive, but they can not assume that the task is completed by the liberal course. Professional courses must keep students practiced in the best they bring and they must exact further growth. There can be no setting up of air-tight compartments between liberal and special training, and therefore no sharp separation of responsibilities. The special professional teacher will still be responsible for exacting an open mind, a judicial temper, resourcefulness in summoning related facts, breadth of appreciation, the orderly arrangement of facts and thoughts, and clear presentation in good English. He can not fail to enforce the standards of liberal culture because some one else has had an original and primary

obligation in the matter. He can not give their enforcement a primary place, to be sure, as he has a special and dominating task of his own, but he should make their daily practice a virile secondary purpose in his work, incidentally but continuously achieved.

There is no specialized line of practical action which is a fit responsibility for a university-trained mind unless it calls for wide appreciations, poise in the presence of many considerations, an intellectual honesty unswayed by vanity or other purely personal satisfactions, a fine sense of craftsmanship in service performed, and a devotion to the welfare of others as above his own material profit. It is for this reason that I suggest that the liberal or cultural aims of higher education should impenetrate every aspect of university life.

It must be clear that I am not contending for the addition of so-called liberal subjects to already overcrowded professional and graduate curricula, but am merely calling for the continuance of that kind of teaching regimen and discipline which is characteristically liberal in effect. Its purpose is to keep specialization in its broad settings and to avoid that rigid and arrogant narrowness which arises readily out of that self-confidence which is bred of high and intensive mastery of a small and segregated field of knowledge or action. Such continuous development of character and culture, the prized possessions of a liberalized personality, will maintain that open spirit and wide critical power which adds side reach to forward reach in the specialized pursuit of wisdom.

The whole problem of developing character and culture is best attacked at the point where it is a central and major responsibility—that is, in the liberal colleges

of arts. At the outset I must express a fear born of experience. Many liberal teachers are such only in name. They have borrowed a title from the subjects they teach, when in fact they carry a departmentalized attitude of mind toward teaching and learning just as restricted as their more defensible associates in the professional and graduate schools. They are not even half saved, as professional teachers often are, by the hovering consciousness that life is just around the corner ready to exact a practical test of training from doctor, lawyer, engineer, farmer, and other intellectual specialists. The need is that they shall be wholly saved by an educational point of view which sees the organized knowledge of a civilization as an instrument for humanizing the young men and women who soon shoulder the burdens of civil life. In the liberal arts college the arts and sciences can not be viewed by the teacher as ends in themselves. They are merely the teacher's means of discipline or training. The teacher must be a specialized scientist or scholar to be sure; we trust that he had acquired a fine manliness before that, but when he begins to instruct in a liberal course he must feel that he is the agent of civilization, one who enforces its finer codes, instills its more accurate wisdoms, and exacts its superior skills. Instructors in the liberal schools need to acquire this educational point of view and make it dominant. This is a first necessity. Meanwhile administrators and public as well as university associates must be appreciative enough of the dignity and importance of this kind of service to stimulate its growth.

Turning from the teacher to the schooling arrangements, we may well admit what has already been hinted, that a liberal education is not a mere course of

study, largely intellectual and more largely informative. It is a course of discipline, a regimen which may be applied with varying wealth of opportunity and varying richness of result in every university course, curriculum, department, or college. Such a statement does not imply that one subject of study is exactly as useful as another for the purpose of training in character and culture. All are useful but not equally useful either in quality or degree. Every subject is a varied opportunity for the training of the mind. When used in proper supplementation, however, it is probable that many combinations of studies could be made, offering a wide diversity of curricula, each as a whole approximately as effective in the development of mind and personality as other combinations. Such a view implies a right disciplinary use of such curricula—a use vastly broad—broader than a simple scientific, scholastic, scholarly, or intellectual use, which is the current tradition in our faculties.

The facts, with their relations and implications, we shall, of course, demand of students. We shall have no standing as an intellectual institution if we do not, but we shall have no effectiveness as an educational institution if we do not do more. Behind the student's rendition of truths, both naturalistic and humanistic, we shall probe for the qualities and forces of mind and character which give lasting capacity for finding and handling truth. Was the right answer given just a lucky guess? Was it verbally memorized from book, fellow student, or teacher? Does the conclusion rest on evidence properly interpreted? Again—is the discussion merely disputatious though brilliant? Is vanity or reverence for truth the motive behind that persistent hunt for facts which now defend a half-

truth? Is the open, sensitive, poised mind being developed? What error of intellectual technique is persistent in the mistakes of the conscientious student persistently reaching honest but wrong conclusions? To one who knows truth and the workings of the human mind, a thousand possible opportunities for training are offered. Alas, we have fallen into the habit of being checkers or auditors of students' statements rather than intellectual diagnosticians, probing and prescribing effectively. With a changed point of view and technique the smart glib youth would no longer have his laugh at fooling us. No more would the public smile at us as we give praise to the industrious and mechanical grinds, delivering truth accurately and without wide understanding, whom we mistake for scholars.

When we ask why we have let the arts and sciences, those virile interpreters and guides to living and working, lose their connections and become monastically intellectual, we are not sure of our answer. The answer is probably complicated. But the omnipresent tendency of elders to impose their own wants on youth probably explains a great deal. With university teachers character and culture are largely stabilized because felt to be possessed. Not so with the truth of a subject; it is never mastered from the point of view of the professor's professionally sensitized mind. The thing he wants himself the instructor exacts of youth. And youth, with half-attained character and culture, is given only a purely intellectual opportunity to deal with a classroom life arranged around the mature scientific problems of the highly sophisticated scholar.

For such classroom hours, the students compensate themselves with a life outside called the college life—

one ingeniously developed for the purposes of self-expression on the plane they live on when they enter the university. Here their emotions and the urgent call to deeds are satisfied, and college life is felt to be a virile life. The crudity of college activities may appall us but it should not surprise us. It was devised by juveniles, without much help from those who are older, wiser, more cultivated, more skillful. We have left a maturing, aspiring, cultivating virility out of our classrooms, and they have devised a kind of their own—a mere adolescent product. Over it we exercise a sort of spasmodic supervision, more corrective than preventive, of a few serious things, enough to protect the university's good name with the public, and the rest we forgive as youthful fun. When we have vitalized our teaching methods and reconstituted our curricula in a way to get the regimen suggested, more of the student's life will pour into the classroom, more of his out-class life will reënforce his classroom thinking and feeling. We shall then not feel ourselves to be weak competitors with the sports, the sociabilities, and the politics of student life. But the college life will not go—it will always be there and ought to be. The harder students work, the more they will need to recreate in play. The university man will find it easier to be true to his ideal of poise and balance if he plays as fully as he works. It keeps the touch of fanaticism out of his devotion to a better world than we now have and keeps his idealism wholesome. It will be a somewhat changed college life, higher and finer and less conflicting with the ideals of formal university life.

We shall need to take it over as a great opportunity for developing character and culture in men and women. It is a life of reality to students. The training they

receive here from associates and elders persists because it is deep rooted in emotions and wide spread in action. If college faculties only knew it, it is the great humanistic laboratory of the college, the one the students provide spontaneously because we can not formally provide it for them. That laboratory needs direction and supervision like every other. Literature and social science are here tried on to life and errors of judgment and skill checked out. Let us assume our jurisdiction over college life, and then develop a culture, one that will not destroy its vivid, interesting reality to young people when we utilize it to deepen the craving for character, thoughtfulness, and culture.

As I think of such a regimen or discipline as this conception of liberal training involves for both classroom work and college activities, I ask myself if it really involves anything we are not prepared to do. We are not without advances in the desired direction. Already we put our learning into a pile and re-sort it into new arrangements of courses deemed impossible a decade ago. Note the successful courses in several of our best institutions devised to give a better approach to the problems of our contemporaneous civilization. The boundaries between departments and subjects and courses fade away with our growing sense of the student's need. The instructor sees now that the classifications and organizations of truth best for the pursuit of knowledge and its ready accessibility to mature and learned minds, are not necessarily the best for the student's groping and growing mind. We are amazed when we note the ease with which we are coming out of our scientific pigeonholes into the central arena of life, where students of college age want very much to be. And we shall be just as much amazed

again when we realize how many students introduced to learning this way will later follow us back to the pigeonholes of advanced specialization. The Cause of Learning is not to be a loser. It will have found a better way to recruit its torch-bearers and to obtain more of them.

We have made our significant advances, too, in using the college life and its activities as a training ground for character and culture. Deans of women have been followed by deans of men, little as conservative university people liked at first to provide them. These new officers of the university, however they originated, now do constructive work. Without much official power but with great tact these officers acquire immense influence. Under their guidance, discipline becomes self-inspired rather than arbitrary, good taste grows in sociability, refinement takes hold of recreation, character displays itself more in service and sacrifice and less in self-seeking, honor enters and controls the sports, thoughtfulness and the judicial mind come into the business enterprises of the student body. We rely more on student leaders and group discipline to care for student morale, and less on the faculty discipline committee. It is remarkable how much suggestion and direction the university student accepts considering his medieval tradition of freedom. The public has long since abandoned the theory that American universities should provide any such freedom to their students as that given by European institutions. The students themselves have substituted the severest possible discipline wherever they require it for their own clear purposes. As a college teacher I have often envied the coaches in charge of crew, football, track, and the other sports. What privileges they have in

holding students up to standard performance and to a definite code! With what sacrificial good sportsmanship do the boys take criticism, struggle to change, and give up the other things they might wish to do. Could we but talk to boys and girls with equal firmness about their intellectual work and receive as loyal coöperation, what miracles of development in character and culture we could perform.

THE UNIVERSITY AND RESEARCH

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THE main sources of research in America have been, and must continue to be the universities. We have a few first-class special research institutes; and we have a great many laboratories of industrial research and development. There are more of these than is popularly known; five hundred, perhaps, counting many small ones. But their work is directed more towards the attack of specific problems of development in the special industries which support them, and less towards the fundamental science that underlies these industries. In some of the larger of these industrial research laboratories, however, able investigators are at work and fundamental research of a high quality is carried on. But in all of the few special institutes, and the many industrial laboratories, taken together, the research output is much less than that which comes from the universities. In addition, of one thing very important to the maintenance of research in the country these special institutes and industrial laboratories do almost nothing at all. That is the development and training of new research workers. This is done almost exclusively in the universities and colleges. Anything, therefore, which lessens the interest and activities of the universities in research, and hence reduces their actual output of research and re-

search workers, is a menace to our national strength and well-being. For this strength and well-being depend, in a very large measure, on scientific research and discovery.

The conspicuous role played by science in the war from its very beginning, and the pressing necessity for solving serious war problems involving scientific investigation, brought vividly to the attention of the world the advantage to a nation of large scientific resources, both in equipment and personnel, and of being able to mobilize quickly and effectively these resources to aid in meeting the great emergencies created by war conditions.

At the beginning of the war Germany revealed herself far better prepared than any other country to take swift advantage of her scientific resources. In my interesting conversations in 1915 and 1916 with officers of the German general staff at their great headquarters in occupied France where I had to reside for some months as chief representative for occupied France of Mr. Hoover's relief organization, I was much impressed by the reliance placed by these officers on the help they were receiving and could always expect to receive from Germany's scientific men. When things were going badly on the west front they would say: "Well, just wait; our scientific men will give us something new. They are all organized; they are all working; they will have something new soon to make your eyes stick out."

It is familiar history now that Germany's science, brought to the aid of her armies and navy, did repeatedly make our eyes stick out, and it was necessary before the war could be won to meet Germany's science with English and French and Italian and American science. We and the Allies had to organize science too,

and, with a haste made desperate by necessity, it was done.

Out of the revelations and experiences of the war came a great recognition and stimulus to the development of science which has resulted in the setting up by America, and several other nations, of new scientific organizations for the encouragement and support of scientific research and its applications by methods giving special attention to coöperative and coördinated work. Such methods involve an attempt to introduce a certain degree of organization into scientific investigation beyond that heretofore usually attempted.

The phrase, " organization of science," produces an unfavorable reaction from some scientific—and some non-scientific—men. It seems to suggest to them attempts to control scientific genius, to dominate scientific endeavor. They say that genius can not be organized, and that scientific research must, like creative art, be left absolutely free from restraint. They ask if Galileo and Darwin and Einstein could have done greater things, or even the great things they have done, if they had been " organized." The implied answer is an emphatic No. And it may be accepted as the correct answer. But the question implies something that is not necessarily implied in the phrase " organization of science."

I know of no one in the National Research Council, nor do I believe there is anyone in the new Department of Scientific and Industrial Research in England, or in the Bureau des Recherches in Paris, or in the National Research Council of Japan, who dreams of suggesting the advisability of organizing, or in any way interfering with, the individualistic work of scientific genius. What *is* suggested as advisable, because it was proved

to be possible and highly effective in our war-time efforts, is to arrange for planned concerted attack on large scientific problems, especially such problems as require numerous coöperating workers and laboratories representing, often, not alone one special field nor even one major field or realm of science, but several such fields, as chemistry and physics, or chemistry and biology, or chemistry and physics and biology, or biology, geology, and engineering, any one of which, and other, combinations, may be involved in the solution of large scientific problems affecting the national strength and welfare.

But even the isolated, individual workers may profit by the attention and encouragement and material support that may be given them by a coherent body of scientific men bringing to bear their collective influence to ameliorate the too often difficult conditions under which the isolated scientific investigator has to work, and to develop a wider appreciation, and hence public recognition and support, of scientific research.

What is the significance to the universities of this increased attention and new impetus to research? And what is its significance to education and its methods? I suggest that this matter is so important that it requires a new and particular examination of the university and general educational situation as regards research and training for research.

The National Research Council has tried to become acquainted in some more exact degree than could be achieved by a perusal of college catalogs, or even an extended question and answer correspondence, with the present research situation in the colleges and universities of the country by means of a protracted series of personal visits by representatives of the council to

some of these institutions. Up to the present one hundred and forty colleges and universities have been thus visited. This number includes enough institutions and institutions of enough variety to give us a fairly clear idea of the status of research and training for research in the colleges and universities of the land. Some day we may be inclined to publish a report or discussion of this situation as based on the information derived from these friendly visits.

But, for the moment, we may assume that we are all sufficiently informed in general of the state of our institutions of higher learning and the state of American higher education to warrant me in expressing certain opinions, or at least certain feelings, about the matter of research in the universities, which your own knowledge will enable you to reject or confirm.

In the first place, university research confronts a serious difficulty inherent in the very make-up and method of the peculiar American institution we call university. This institution *is* a university because it does university work. It isn't a university because it does much work that is not university work. To house under the same roofs, mix in the same laboratories, lecture-rooms and classrooms, and have sitting at the feet of the same instructors both preparatory and university students, is to produce an educational situation unique and very difficult—I should call it impossible—of successful carrying on. It is carried on, but not successfully.

In the second place to give most of the attention, energy, and money available to this curious institution to the preparatory students in it, because there are more of them than of the advanced students, is to place

in secondary position the real university interest and members of this institution.

In the third place to give more attention and effort, as we really do, to the less capable, the uninterested, the non-attaining students than to the more capable, the interested, and the attaining students, both in preparatory and university groups, is a menace to the highest usefulness of the institution if it is to exercise its true university function, which is the development of thinkers and leaders for the country. Even in a democracy, perhaps especially in a democracy, we must take care to make the best use of our best brains.

In the fourth place to encourage the non-intellectual activities of the institution, such as its mere expansion in size, its display, its prowess in athletics, at the expense of its truly intellectual activities and achievements, is not grateful to the eyes of believers in the great need and importance to the nation of a university system of highest standard.

All these conditions, characteristic of the present American university, as I believe all you who know our universities intimately will admit, are serious difficulties in the way of the successful prosecution of research and training for research in their institutions. And this is true even when we construe research not in the narrow sense to which a growing technical and reverential use of the word tends to limit it, but in the most generous way in which it is entitled to be used, namely, simply as a going on in the quest for knowledge from that which is now known to that which is now unknown. These conditions to which I have referred are not only difficulties in the way of the development and achievement of research, and specific training for research, as such, but they are difficulties in the way of the highest

development of the whole intellectual atmosphere and achievement of America. The "Failure of the College," about which Professor Chapman of Yale writes so vigorously in a recent number of *School and Society*, is not simply the idle or sensational phrase of a sick pessimist, but it is a phrase that well expresses the thoughts of almost all of us and that makes almost all of us feel sick as we face the facts. Yet we all go on; the colleges and universities all go on in the usual way, as if the whole situation were out of our hands and in the lap of the gods for outcome. We act as if we were helpless; but that we should really admit that we are helpless is incredible. It is not American. It is not what we did when we faced the enormous problems of war. Do we have to have war to be capable? I am every day growing more impressed with the simplicity of war. War, which is supposed to bring complexity, brought us to simplicity and directness of thought and action; while peace, which should bring simplicity, has brought us to a perfect maze of complexity. No thing was too bold for us to attempt and achieve when we were at war. No thing seems capable of direct attack and solution now that we are at peace. But that is the sick pessimist again. And sick pessimism must not rule us. I am sure it will not. It is incredible that in this all-important matter of getting our higher education straightened out right we shall go on indefinitely acting as if we were helpless. Let the college or university that wishes to do the greatest thing just now to be done for higher education and true learning in America, step forward and boldly do the unusual thing. Let it devote the most of its energies to the most important part of its work. It will soon

not be alone in its doing. It will become a prophet with honor in its own land.

The National Research Council has recently interested itself in an inquiry as to what is being done to discover and encourage the students of superior capacity and attainment in the colleges and universities. And in an attempt to indicate what might be done in this way and the value of doing it, one of its representatives has visited, since the first of February, about fifty institutions on this special quest and for this purpose of friendly suggestion. He finds a lively appreciation of the importance of the matter, but a rather faint heart about doing anything about it.

In an interesting report recently made by this visiting representative to the council's Division of Educational Relations, he gave the following account of certain impressions he had gained from his visits.

" Although," he said, " each ambitious teacher is anxious to develop leadership, yet, on the whole, when judged by distribution of time his emphasis in fact is laid on helping the mediocre in ability and the deficient in attainment. At first consideration, a teacher is inclined to deny the accuracy of this statement, but the visitor has found that after a brief discussion there results a fairly unanimous assent to its truth. The individual encouragement of the student of ability is one of the delights of the professor, but his class-room efforts are of necessity gauged for the average and the presence of the passing mark attracts his attention automatically and constantly to those of low standing. In other words, the routine demands a constant interest in others than the most able.

" None of the colleges visited is approximating its maximum service in the encouragement of superior attainment and in the detection and development of superior ability. The methods used by any institution have been adopted fortuitously rather than as a consequence of a definite sustained study of the problem. This is to be expected since the problem is really everyone's

business, and concerted study and action are only given spasmodically when some one member has a single proposal that can be presented to the faculty in a form for action. This is not to be regarded as indicating a criticism of the professor but rather a weakness in our system.

" Numerous colleges are utilizing mental tests in one way and another, but, because of the time and hence money required, such an activity is not as widespread as it should be. Obviously such tests would be helpful in detecting superior ability. The inactivity of other colleges in this matter can be accounted for by the fact that no individual has the time to devote to it and the administration or the faculty is not adequately informed concerning mental tests."

The matter of the utilization of mental tests in helping to discover the students of superior capacity and hence possibility of superior attainment, involves a wider recognition than now exists of the positive use which modern psychologists are more and more making, in their development of the applications of psychological science, of the fact that not only are there such marked differences in native intellectual capacity or ability among persons as to permit of the setting up, on a basis of intelligence tests, of such categories as idiotic, feeble-minded, subnormal, average normal, superior, and genius, but that within the group of so-called mentally normal human beings, which includes most college students,—I say this with full regard to the apparent conviction of some professors that all college students are morons—in this mentally normal group there still exist rather large differences in intellectual capacity. We all know this to be a fact, but few of us give it sufficient attention; few of us give it sufficient importance as an aid in guiding our practical activities. Now the value of the university's product is, as Terman well says, determined as much by the original quality of

the raw material with which it works as it is by salary budget, instructional methods, or curriculum. In an abundantly documented recent paper, this active exponent of modern psychology reveals the high significance which an analysis of the intellectual status of the student body of a university might have as a basis for positive action by any university determined to make the best use of its available resources for the advancement of American learning. He shows the positive economy in money, time, and mental energy that could be effected by certain radical changes in university administration, and the highly desirable results which would come from these changes in the way of enabling the university to fulfill its highest function in the advancement of learning both through teaching and research. And only by such fulfillment on the part of the universities can the nation make the most of its potential mental capacity.

I seem to have wandered somewhat from the particular subject which the title of my paper indicates to be especially mine this afternoon. But all of the things I have talked about have their definite relation to research in the universities. Yet one important phase of this subject I have alluded to by no more than a fortuitous juxtaposition of words. The relation between research and teaching is a subject which alone calls for another and longer paper than all of this present one, which ought to be inflicted on you sometime by somebody. This is not the time nor am I the brutal body to do it. But I can not refrain from calling your attention, in my last moment with you, to the additional evidence of the curious and abnormal character of the institution we call university in America, which is afforded by the strange and highly injurious

artificial opposition that has been created between research and teaching by the customs and methods of American higher education. Research and teaching are inseparable from, and indispensable to, each other in a real university. An institution which does radically separate or oppose them is not a university, however good and useful some other thing it may be. The University of Minnesota *is* a university because it is an institution which recognizes the intimate relationship and advantageous coincidence of teaching and research. And we may rest happy in the assurance that under its new President it will evermore brilliantly fulfill its genuinely university function.

THE DEVELOPMENT OF THE COLLEGE OF COMMERCE AND BUSINESS

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THE college of commerce or business administration has knocked at the doors of the American university and in nearly every instance has met a warm and enthusiastic welcome. This latest candidate for admission to the sisterhood of colleges in the American university has scarcely yet emerged from its swaddling clothes. The Wharton School, the first of these schools or colleges was established at the University of Pennsylvania in 1881. The College of Commerce and Administration of the University of Chicago was founded in 1896, a school of similar character was established in the University of California in 1897, and the Amos Tuck School of Dartmouth was founded in 1900. The Wharton School did not rise to the dignity of a professional school during the first twenty years of its existence on account of the character of the courses it offered, and because of the qualifications of its teachers. Its teachers had little or no business experiences, but little contact with the business world, and the courses offered were the traditional courses in economics somewhat modernized by the studies made by economists within this period. When the University of Chicago and the University of California schools were first organized they were little better than paper schools and

many years later they were both reorganized as schools or colleges of commerce.

The decade from 1900 to 1910 was marked by the expansion of courses in applied economics in nearly all the leading American universities either under the administration of the department of economics or under a distinct organization as courses in commerce or as schools of commerce.

The work in applied economics was gradually expanded and within the decade from 1910 to 1920 many schools and colleges of commerce, or business organization, were established. This activity has been especially marked since 1915. The war gave a great impetus to this activity and now there are but few universities and colleges of standing in the United States that have not organized applied courses in economics whose purpose is to train students for the business world. The popularity of this new departure in education is seen in the rapidly increasing registration in these colleges in the last six or seven years and especially in the last two or three years. In a number of instances where the college or school is on a four-year basis it is the largest college in the university, and in a number of other cases, it promises to be the largest college within a very brief period.

The Amos Tuck School of Dartmouth College has a two-year course and is both an undergraduate and a graduate school. It is based on three years of college work and its second year leads to the Master's degree. The Harvard Graduate School of Business Administration was organized as a graduate school with a two-year course. All the other colleges of commerce of the country offer undergraduate courses leading to the Bachelor's degree. Some of these have four-year

courses and others have two-year courses based on two years usually of liberal arts. In the latter case the first two years may be definitely prescribed as pre-commerce work or in other cases only a few prerequisite courses are prescribed. Whether the colleges have a four-year or a two-year course the amount of commerce and so-called liberal arts work is about evenly divided as there is in each case about two years of liberal arts and about two years of commerce work. As to whether the commerce course should be of two- or four-year duration depends upon the relative importance of supervising only two or four years of the student's work.

The development of higher commercial education abroad especially in Great Britain and Germany has coincided with the development of commercial education here. The trade school in Germany has been thoroughly developed for many years. Within the last twenty years the advanced commercial school has developed, emphasizing especially a kind of training which qualifies its students for positions in export trade with the obvious national purpose of promoting the foreign trade of the German Empire. In Great Britain in the last twenty years higher commercial education has been developed by the great city universities such as Birmingham, Manchester, Liverpool, and London and these universities are reaching thousands of students who are interested primarily in business education.

At this point I wish to consider the following questions:

(1) What has given rise to the development of higher commercial education in the last twenty years; (2) what is the need for it; (3) what do busi-

ness men think of this training; (4) how are the colleges of commerce meeting the demands made upon them?

In discussing the demands for the development of higher commercial education I will not list these in the order of their importance.

1. The interest of the American producer in the markets of the world especially since the Spanish American War emphasized the need of a knowledge of foreign trade. It was pointed out that the salesmen of other countries which conducted a large foreign trade had a usable knowledge of the language of the country where they were selling and also a knowledge of the customs and tastes of the people and of the peculiarities of their markets. The absence of this knowledge placed the American salesman in foreign countries under a great handicap. It was believed that this knowledge could be acquired in the schools and that the American university should offer training to young men who might be employed either in the foreign trade departments of American manufacturers or as their representative in foreign countries.

2. Expert service was in demand in the departments and bureaus of the United States Government such as the Department of Commerce, the Bureau of Corporations, the Bureau of Statistics, the Immigration Bureau, and the Census Bureau, and the professors in economics saw that there was a national need for a kind of training for which the American universities had inadequate facilities.

3. Much more important than these was the development of great complexity in business in the last forty years and the consequent belief in the need for trained men for business leadership.

The College of Commerce and Business

What is the actual need for the kind of training the colleges of commerce are attempting to give?

Business men have often commented on the wide chasm between the experience and life of the average student especially those taking the type of a course offered by a liberal arts college, and the experience and life of the average business man and they have regretted that nothing was done to bridge this chasm. They speak feelingly of the difficulties and of the expenditure of much energy in breaking in these young business recruits and have often expressed the hope that the universities might do something to eliminate this needless friction, loss of energy and of time, amounting in some instances to two or three years, and it should also be said waste of money, involved in making business men out of them.

a. In the more highly developed branches there is a need for trained experts such as accountants, actuaries, and statisticians. It is possible for the university to train these experts and hence the organization of departments of accounting, statistics, etc. Public accounting has attained almost the dignity of a profession and as there is a great demand for men trained to fill the ranks of this profession, the accounting department has become one of the best organized divisions or departments in the colleges of commerce.

b. It is sometimes said that our great captains of industry became great leaders without a business education and many of them without a college education. The opportunities for great achievement with great resources and without strong competition were better in the

past than they ever will be in the future. For these reasons our new captains of industry must be better equipped and better trained to compensate for the handicaps in the future as contrasted with the older captains of industry.

Moreover business has not now the training value it formerly had because the employee must now enter the business world through a routine position. These are times of specialization in business as in everything else. The young man who starts his career in a routine position has not often the opportunity of seeing clearly the relation of his work to the work of other employees where the business unit is large and complex, nor of the relation of the business unit to others. His experience in his routine position does not give him the training and experience which will enable him to rise to a managerial position. The young man who has had business training and knows something of the complexity of the business organization and the relation of his work and of his department to the larger unit will have a breadth of view which will enable him to rise.

Moreover the literature of business has increased to such a point in many fields that no business man can keep up with it and even if he could keep abreast of his literature, the demands upon his time and his energies in his everyday work would make it impossible for him to train the young apprentice in the practice of his business.

A decade ago the heads of the schools of commerce felt the need of proving to the business man that collegiate schools of business were worth while as training schools in business and that the business man should come to the collegiate schools for his new recruits in business. The need of proving his case is now no longer

necessary. The business man has given his approval of the college of commerce with the reservation shared also by the college man that changes should be made in the curricula and in the teaching of the college of commerce which will more definitely adjust the training of the school to the best experience of the man in business.

As Dean Donham of the Harvard Graduate School of Business Administration has well said, "There is clearly a growing recognition among business men that the breadth of training so difficult to obtain in a business organization is possible in a business school and that adequate business-school training offers a short method by which a business enterprise may obtain trained executives or the individual secure an executive position."

Business education is now going through the same stage which medical and legal education went through years ago. There was a time when a man might become a physician by reading medicine in the doctor's office, going with him on his visits to the sick, and assisting him to perform his operations. Later the proprietary medical school was established with low standards of admission and relatively low standards of teaching. Now the medical school is established as a division of the university, a definite body of medical knowledge has been accumulated which is systematically taught, and the university has close relations to a hospital so that both theory and practice are taught.

Legal education went through the same stages as medical education. The student read law in a lawyer's office, took note of his interviews with clients, went to the court room and observed the practice of the law, imitated his teacher in his knack of handling cases, applied for admission to the bar, and became a lawyer.

The proprietary law school succeeded this haphazard method of training the lawyer and later we have the law college as a part of the university organization.

Until recently it was assumed that the only way in which a boy might become a business man was to take his place as office boy, do chores until the business man had confidence in him, and then by degrees he would be given more and more responsibility until if he proved his worth he might become a business man. A time will come when these haphazard ways of studying business will be just as cordially disapproved as the corresponding ways of studying law and medicine. Next the proprietary schools or business colleges of high-school grade claimed attention with an emphasis on the training to do specific things such as stenography, typewriting, and keeping books. The latest stage is the collegiate school of business or commerce in the university which assumes that the student should have definitely prescribed training before he begins his business course, that the business course should be based on business experience, that its subject-matter should be so organized and presented as to afford superior discipline and training, a training which should also make the student aware of the social obligation and ends of business before he is sent out to practice it.

Because of the newness of our discipline too much is now expected of the young man just graduating. More can not be expected of our graduates than of the graduates of the law and medical colleges. The young graduates of the law and medical colleges must take their places on the lowest round of the ladder and gradually climb up as a result of patient toil and experience. So also must the graduate of the college of business take his place on the lowest round of the ladder in a

humble place in the business organization and gradually climb to places of responsibility. He will not attain to an executive or administrative position of importance until he has acquired the routine and technique of a business and until he has proved his worth as a man of sound business sense and judgment.

Business organization has attained a degree of complexity within the last thirty years undreamed of even a half century ago. The business units engaged in production are becoming more numerous, much larger, and more complex. The writer visited a manufacturing plant a few days ago which has employed as many as thirty-four thousand men. An organization of this sort requires many executives of different types and of superior ability. A development parallel to production is taking place in the fields of finance and in distribution. Until recently the subject of distribution or marketing was not considered of sufficient importance for serious study. The writer of this paper offered the first course ever offered in an American university on the subject of marketing at the Ohio State University in the spring of 1904. Now every university or college in the country offering courses in applied economics gives one or several courses on the subject of marketing, and it has been frequently pointed out that the opportunities for improving the industrial organization are greater in the division of marketing than in any other. One who studied finance twenty years ago in an American university would be utterly bewildered to-day in the finance departments of some of our universities with the number of courses and the complexity of subject-matter; and the changes which have taken place in the teaching of this subject in the last twenty years have simply par-

alleled changes which have taken place in the business world.

A large and increasing body of knowledge in business experience has been accumulated and classified in all lines of business derived from the experience of business men; there are well-recognized principles of business established as a result of experience and experimenting of the captains of industry and as these principles or rules of business have been established by experiment covering a great variety of conditions they have all the force and validity of scientific law. This body of business experience and these principles or laws coming out of business practice constitute the subject-matter of our schools of business administration. This body of knowledge may be taught as effectively as law, medicine, engineering, or any other body of knowledge may be taught. But what of its disciplinary value? Can this knowledge claim a right to university consideration because of the discipline and the training it affords. We believe that it can claim such right to consideration.

The subject-matter is taught by the textbook method, the lecture method, the problem method, and the field-work method. The textbook and lecture methods lend themselves to survey courses where it is desired to present much systematized factual knowledge in a brief period of time. The supervised field work in business positions is valuable to verify principles by practice and to bridge the gulf between academic teaching and actual business practice. Practical business judgment is developed better by this method than by any other method. Some universities are now dividing the student's time equally between university and the office or factory. Most representatives of

colleges of commerce believe that this is assigning to practice in school work too large a place. The business student has but a few years to study principles and get a comprehensive grasp of business while he has a lifetime to pursue business practice.

The problem or case method lends itself to business education as it does to law and philanthropy. Most of the work of the business executive comes to him in the form of problems. He has before him a certain set of business conditions from which he must organize his business policies and make decisions. Every executive can reproduce a large number of problems, which have come to him and which he has solved wisely or unwisely. Problem books are being published giving business problems which have come up in many businesses. A comparison of these problems and their solution is very valuable to the business student. The chief value of the problem lies in the solution of the problem by the student himself. The problem method can not be used by the student exclusively. He must be given a background of the literature of the subject to assist him in the solution of the problems. But in the solution of these problems, he deals with the same set of conditions as confronts the business executive.

Aside from the training of men to do specialized work as accounting, statistics, actuarial work, it is the function of the college of commerce to train business executives. Courses are offered in finance, transportation, marketing, foreign trade, manufactures, etc., but the purpose in all these courses is to train business executives and they may be trained as well in one field as in another. The business executive needs a comprehensive knowledge of his subject-matter, a power of logical analysis, a capacity for generalization, and a

vision which will enable him to see the consequences of adopted policies. The great geniuses of to-day are in business organization and in technical fields of knowledge. Their commanding power and ability have been displayed in the intricacies and complexities of business organization and in the solution of these problems of world-wide significance and scope. As literary knowledge and skill can be acquired best by a study of the masters of literature, as military tactics and military knowledge can be best acquired by the study of the tactics and methods of Napoleon and other military leaders, so a knowledge of business organization and skill can be best acquired by a study of the masterpieces of our business geniuses which are the business organization which has been established and the great economic problems of world-wide significance which have been solved. A study of the solution of these problems requires keen analysis, logical thinking, an ability to distinguish between the more and the less important economic phenomena, the discovery of causes from a network of complex economic phenomena and the ability to generalize from particular facts to accurate conclusions. In the light of these things we are prepared to contend that few subjects for study have the disciplinary value as the subject-matter for study of a college of commerce.

Let me illustrate from the field of retail merchandising where it has long been assumed that the retail merchant and his employees were simply shoppers who are following an occupation which does not require much intelligence or a good education. We have come to see that retail merchandising furnishes scope for the highest type of capacity and business ability. The successful retail merchant should analyze his market,

know the classes of consumers to be aimed at, and the conditions determining the demand for his products. He should know who are buying his commodities, who might buy them, and what the buying motives and habits are of those who buy the class of products he sells. He should also know if price, style, and quality are the determining factors in purchasing because if this is the case, the shoppers will go from store to store and purchase after making a careful comparison of these elements in what he proposes to buy. He should know the age, sex, occupation, race, living and economic conditions of his prospective purchaser and he should know how these and many other factors affect their buying habits. It is only after making a thorough analysis of all the factors affecting consumers' demand that he can organize his store so as to furnish a class and kind of merchandise and the sort of service that will satisfy all the requirements of consumers. The great stores of Wanamaker, of Philadelphia and New York, and of Marshall Field, of Chicago, and the great mail order houses of Sears, Roebuck and Montgomery Ward, of Chicago, are monuments of this sort of sagacity and business ability.

The rapid organization of colleges or schools of commerce in all parts of the United States together with the great increase in enrollment in the last few years has made it extremely difficult for administrative officers to meet the new responsibilities imposed on them. The supply of teachers has been wholly inadequate for the work to be done. To add to our troubles business has held out alluring offers and some of the most competent men to teach business subjects have left our ranks in response to the call of the business world. The result has been that business teachers have

been compelled to teach large classes and young men not well trained have been called into the service. The situation would be well-nigh hopeless were it not for the fact that business men with university training have responded to the lure of the campus and have joined our ranks.

Colleges of commerce are in most instances an outgrowth of departments of economics and most of their teachers have been drawn from departments of economics, many of whom were trained in an earlier regime where the phenomena of the business world was not the subject for study. We have seen in many cases a change of title of courses to suit modern demands with but very little change of content. Wherever this is being done colleges of commerce are not measuring up to their obligations and responsibilities.

We are in a transitional stage. We are confronted with rapidly changing conditions and an extraordinary pressure of numbers to be taught. Changes in educational program and system must be worked out slowly. Relatively few of those who attended the recent National Conference of Collegiate Schools of Business Education were satisfied with what we are now doing in curriculum, and in methods of teaching. This is a hopeful sign. It means that changes will continue to be made which will place the teaching of our college on a higher plane.

The university has a definite obligation to the business world similar to its obligation to medicine, law, agriculture, and engineering. Many more students who come to the university go into business than into any other single field. The university has an obligation to these young men and young women in training them for their life work; but greater than its obligation to

these young people is the obligation of the university to the state and nation in promoting the general welfare through the education of these students and through the scientific investigations of its teaching staff in raising the standards of business practice, in improving the efficiency of business organization, and in increasing the wealth of the state and nation.

THE UNIVERSITY AND PUBLIC HEALTH

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IF asked to name "the books of the hour," the "most interesting books of the past season," we should select not works of fiction alone, although we would that the skillful pen of some novelist might have toned down the bald truths, might have camouflaged in some degree the accusing revelations of one of those we would name—we refer to one entitled "Second Report of the Provost-Marshall-General to the Secretary of War on the Operations of the Selective Service System to December 20th, 1918." The chapters to which we invite your attention are those reporting the physical condition of 3,208,446 young men examined between December 15, 1917 and September 11, 1918 where we learn to our surprise that of these three million examined 521,606 were totally disqualified from military service because of physical disabilities. In fact, only 70.4 per cent of the entire number were found physically fit to fight; 13.3 per cent, rated in Classes B and C, might be accepted after some operation had been performed or were capable of limited service; while 16.25 per cent, or the 521,606 in Class D, were rejected. Such a report startles even those of us who have been actively engaged in medical work.

Of this half million rejected for physical disabilities 13.1 per cent, the largest group of all, had diseases of the heart and blood vessels; 12.3 per cent, the second

largest group, had diseases of bones and joints; 10.6 per cent had eye trouble; 8.7 per cent, tuberculosis of the lungs; 8.4 per cent, developmental defects; 6 per cent, hernia; 5.2 per cent, mental defects; while 5.1 per cent were rejected because of nervous and mental troubles. There were also twelve other groups but these eight contained 70 per cent of the half million. The saddest part of it all is that at least half, certainly more than half, of these defects could have been prevented had they been treated early.

To-day our chief interest lies not in the whole number but in 16,008 of them; young men from Minnesota who physically were not fit to fight. This state may well boast of her soil, of her climate, and of her sons and yet, rate each of the forty-nine states (including the District of Columbia) according to the per cent of those found physically fit and she ranks the thirtieth.

Let us now study these physical defects separately and ascertain where as regards each Minnesota stood. In the group of the respiratory diseases (not tuberculosis) Minnesota stood fourth; that is, in only three states was a smaller percentage rejected for this reason. As regards venereal diseases she stood tenth; diseases of the eye, twelfth; alcohol and drugs, fourteenth; pulmonary tuberculosis, sixteenth; diseases of the bones and joints (the second largest group of all), seventeenth; diseases of the digestive system, seventeenth; pathological flat foot, eighteenth; nervous and mental diseases, eighteenth; diseases of the ear, nineteenth; and hernia, twenty-fourth. In these eleven groups Minnesota stood in the better half of the list of states, but in the following nine her record was not as good. in that of the developmental defects she stood twenty-sixth; thyroid diseases, thirty-first; diseases of the heart

and blood vessels (the largest group of all), thirty-second; mental defects, thirty-third; diseases of the teeth, thirty-fifth; genito-urinary diseases (not venereal), fortieth; tuberculosis of other organs than the lungs, forty-third; and in skin diseases she stood forty-fifth.

But such figures deserve closer study. In the first place, those states which have a much better rating than Minnesota could scarcely have earned this by any unusual efforts on their part to conserve the health of their population. Oklahoma stands first and among those which follow closely are Idaho, Kansas, Nebraska, South Dakota, and Wyoming, states which, while they have active boards of health, certainly have not made unusual progress in health legislation or administration. Nevertheless one qualification should be made to this statement. We are informed that the health officers of some of these states have testified to a splendid coöperation on the part of the practicing physicians and this may prove more important than more officers or better laws. Of those states, on the other hand, which have made special efforts along the lines of public health and whose health legislation and administration are often cited as examples for others to follow, Massachusetts, in this report, stands fortieth and New York, forty-first. Below New York are Arizona, California, Colorado, and Washington, states to which many have moved in the search after better health, and Connecticut, Vermont, Rhode Island, and Michigan. Indeed, the superficial observer might conclude that the incidence of physical defects in the several states varies directly as the effort made by the state authorities to improve public health, and then explain this on the ground that that state which by

general measures best protects the health of its citizens would preserve alive many who under less favorable conditions would die and therefore would have a larger percentage of defectives than would others. But this remains to be proved. Their rating depends far more on the age of their settlement, the density of their population, and the percentage of alien immigrants they contain. The plain truth is that the record for the entire United States, our country of whose human resources we have so long boasted, was surprisingly bad.

The Federal government, in view of the difficulty encountered in raising an efficient army, now tries to aid the states to improve conditions. Money has been appropriated with which to develop courses of hygiene in our colleges and universities; experts provided to assist in public education and in the organization of state societies to promote public health, etc. But the problem belongs to the states themselves. This is not merely a war measure. You, Minnesota people, desire that your boys and girls be healthy; that they be fit for war, yes, but also for peace; fit for marriage, fit to be parents, fit for business, fit for the farms, fit for the towns. A healthy population should be your ambition for there is no wealth which can be compared with that.

With this in mind many are asking "What must we do?" And certainly they will turn for an answer to the faculty of this, her great University. In studying this question may we not first discuss state health administration in general. While the activities of state officials seem to have influenced the incidence of physical defects of individuals but little, if any at all, yet that there has been an increase of the average duration of human life by at least fifteen

years there is no doubt. May I at this point emphasize a truth seldom mentioned, that this increase in the average duration of human life is little, if any, a part of that remarkable general improvement of the past generation in our social and industrial conditions. Quite the contrary. The forces behind that improvement would have, had they not been specifically counteracted, tended to shorten life. I refer especially to the increase in size of our cities, to our crowded tenements, and especially to the crowded school buildings with even two thousand children under one roof. I refer to the problems of a supply of safe water to a great city and to those many problems of food productions, its preservation and its distribution. It is the direct result of research in the medical sciences that the medical man and his co-workers have been able to defend you against dangers which increase almost as the square of the increase in density of population. They have lengthened life despite the influences of forces increasingly powerful to shorten it.

While it was the medical man who at the beginning inspired and directed this splendid service to mankind yet to-day, unfortunately, the practicing physician plays a surprisingly inconspicuous part. It was not the physician but the sanitary engineer who has furnished you with pure and safe water, who has planned the heating and ventilation of your buildings, built your sewers, and cared for your garbage; it is the doctor of veterinary, not human, medicine who watches your meat foods, protecting you from terrible diseases which continuously threaten; it is the graduate nurse who purposes to protect your school children; and it is the social-service worker who claims to hold the key to even greater reforms; it is the doctor of philosophy

not the doctor of medicine who has furnished what some authorities claim has been the greatest stimulus of all to right living. I refer to the statistics of life insurance companies. And finally that movement which promises most for the health of the future generation, the organization of the boys and girls, the Boy Scouts, the Camp Fire Girls, the school health organizations which teach the outdoor life, which foster athletics, these are the work of naturalists, of military men, and of school teachers. The medical man may originally have pointed out the way but to-day the astonishing thing is that sanitary engineer, veterinarian, nurse, social-service worker, health officer, naturalist, soldier, and school teacher when discussing public health seem to point at the practicing physician and cry out "Slacker."

That I am not overstating this allow me to quote from Park's book entitled "Public Health and Hygiene," the last book from the press and to-day the authority in this field.

"It is a regrettable fact that a large part of the physicians, especially those of the remoter rural districts, are greatly in need of health education." (Page 752.)

"The holding of health institutes" (by departments of public health) "constitutes another excellent means of reaching the physicians. Such institutes may consist of courses of instruction. For all of these the health departments will probably have excellent facilities available. Needless to say such courses should be free to all registered physicians." (Page 753.)

"Private practitioners of medicine are inexperienced and untrained along most preventive lines of work, and will remain so until the people become educated to demand that their medical advisers shall be responsible for preventive work." (Page 567.)

"Departments of health" (active health officers who are competent diagnosticians) "are raising the standards of the

practice of health. They constitute almost the only power that compels physicians to study and to keep up with the times." (Page 569.)

"Under certain conditions a more lasting impression" (on the physicians) "can be made by strict enforcement and the exaction of a penalty....The example of New York City... shows what can be accomplished by prosecution of all offenders" —(doctors). "Law enforcement must, therefore, be classed as an important educative factor." (Page 753.)

On other pages we learn that the public is to be saved from destruction by public-health officials and by public-health nurses. Others would add the social-service workers. One of the latter, a national authority on this subject at a recent meeting attended by the prominent social-service workers from the entire country exclaimed, "We must humanize the doctors," and later another added, "We must save the medical students."

There you have it. What a picture of practicing physicians! Ignorant, behind the times, unprogressive, obstructionists in matters pertaining to the public health, criminals, corrupters of youth! How like the verdict which sent Socrates to his death!

Let me say here that I have no patience with all this. I am reminded of a visit I once made with a group of students to a city power plant. Our guide was a professor of physics, an authority in his subject. The foreman of the plant crowded as close to us as he could to hear what the professor was saying as he explained to us the scientific idea of which each machine was the expression, but it was evident that he understood little. Watching his opportunity when the professor was not near he whispered to us, "Say! that fellow may use long words but he couldn't run

this plant for one day." No, perhaps the professor couldn't, but in about one week he could master all the details of its operation, while that foreman might study for years and then fail to take the professor's place.

But the fact remains, we physicians are viewed in an unfortunate light by those whose highest respect we should have, by those whom we should inspire.

It has not always been thus: one generation ago the doctor was the respected authority in his community, certainly in matters pertaining to public health; yes, and in other subjects also, even in theology, for some were sure that he knew more about the miracles of Christ and the secrets of his birth and death than did the clergyman. But in that day there was practically no preventive medicine and no well-founded hygiene, and neither was there much surgery or any of the modern medical specialties. Since 1880 the medical sciences have advanced with phenomenal rapidity and remarkable success. The modern graduate in medicine is not an ignorant man, but the product of the hardest department of the university; he is not behind the times in his own special subject; he is not a criminal unless it be that he regards with ill-concealed contempt the quality of the medicine which the part-time health officer, the nurse, and the social-worker inflict on a trusting public. Since 1880 great progress has been made also in preventive medicine and in hygiene based on the pre-clinical sciences so that these now are major subjects. But of these the medical student now hears but little, since the curriculum is so crowded by the medical specialties. He therefore enters his profession ignorant of this special field, while public health, especially hygiene and preventive medi-

cine, has short-circuited through the health officer, the specially trained nurse, and the social-service worker, who soon gain more technical knowledge in these subjects than have the physicians practicing in their community and who therefore feel correspondingly superior. And who is to blame? The medical faculties of our universities. The student must be trained at least to appreciate this field. One of our best teachers of hygiene wrote me last week, " I am confident that if the medical profession does not take up this matter" (hygiene) " the layman will and I do not believe that control should go out of the hands of the medical profession."

There is still another aspect which this problem presents, that of the practicing physician in his own field. Never has he been busier and more successful and yet never has the public apparently been less well and yet truly better served. The communities formerly had about three times too many doctors in proportion to population and so became accustomed to a certain amount of medical attention. Now, they can not get this much attention but they have not yet begun to realize that they are getting something far better, improved medical service. In 1904 there were in this country one hundred and sixty medical schools in which were enrolled 28,142 medical students. In 1920 there were eighty-five schools and 14,008 students of which only 3,047 were senior students. That is, only about half as many doctors are graduated each year as were sixteen years ago and of these an even smaller per cent are entering general practice since many begin at once to prepare for the various specialties. Those who do enter general practice are crowding into the larger cities leaving wide rural districts without a practicing physician within from ten to even twenty-five miles. The

residents of the rural districts now complain that they are deserted and appeal to the state for relief. They even talk of " state medicine," that is, the medical care of the people by state officials, public-health officials, rather than by private physicians.

So much for the past and present, but what of the future? Hygiene's successful efforts of the past have been those affecting man's environment; to lessen the number of defectives in a community we must affect man himself. The average citizen rather enjoys watching the sanitary officer attack the big packers, but he defends his own back yard; he insists that the pollutions of his city's water supply be eradicated but not those which pollute his own blood stream, that is, his tonsils, his gall bladder, etc. He does not get very excited when the doctors puncture the skin of his dairyman's cows with a hypodermic needle, but he does when we propose to use a similar test on his boys and his girls. A man will do almost anything the doctor he chooses and trusts asks him to, but the best of health officers with police power will meet with difficulties if they try to force him.

Our local boards of health and health officers have indeed cut a sorry figure if we consider the service they might be to the public. These officials have been for the most part very poorly paid men who dare not and will not allow their public service to act detrimentally to their private practice. Our laws, many of them excellent, are poorly enforced, but their enforcement is the measure of the popular support they receive, and their weakness is largely due to lack of support from the practicing medical profession. Many now propose to correct this difficulty by employing better trained and better paid full-time local public-health

officers to deal not only with the community's environment but also with her individual members. This is, we think, beginning at the wrong end of the problem. A well-trained medical man with police powers and a conscience would to-day have a sorry time of it if he tried to lower the percentage of physical defects in his community, and the better trained he was the more unhappy would his lot be. Imagine him as he attempted to curb an epidemic of measles in the only way in which one can be curbed, by quarantining the suspected children four days before the measles rash is out; or one of scarlet fever, by excluding from school some children who have no fever and who never get scarlet. Diphtheria is spread chiefly by those who do not know they are sick and typhoid fever by others whose fever of ten years ago was called " malaria." To stop tuberculosis we must handle drastically not the man who feels sick but the man who " got well" years ago and who now in middle life and on good terms with his tuberculosis feels well and strong, who never loses a day's work as he spreads his infection far and wide and who enters the bonds of matrimony even four times, burying each susceptible wife after a few weeks' illness of acute tuberculosis. Watch such a health officer as he attempts to reduce the per cent of those with physical defects by leading to the operating table an army of boys and girls for tonsillectomy, abdominal operations, etc. His police power may succeed with the children of the ignorant, but will not with those of college graduates. Consider that best proved method of preventive medicine, vaccination against smallpox. You can with less opposition vaccinate every person in the slums of a city than every student in a university. The opposition to corrective medicine

is from those more or less well educated in all branches but in hygiene. And yet a corrective medicine it must be.

We can not divide the health problem into "environment" and "individual" for more important than either is the human environment. The health of the individual depends in the long run on the health of the the community. If I wish to be well and to have my children well, I must begin not with mine, but with my neighbor's children. A former prime minister of England lost his only daughter from typhus fever, a disease the very name of which suggests poverty, filth, and degradation. It developed that the opera cloak which she wore one evening had, the evening before, been thrown over the bed of a poor, sick girl in the slums of London, the sister of the seamstress who had taken it home with her to finish it so that it might be delivered on the promised day. The lesson to be drawn from this is that even the daughter of the prime minister of England is in danger of typhus fever as long as there is an epidemic of that disease in the slums of London. The citizens of Washington were a few years ago worried by the prevalence of certain diseases, only to learn that if those who inhabited the mansions along the great boulevards wish to be well they must watch the health in the hovels of their colored servants who lived in the alleys. As long as there is a case of typhoid fever or a typhoid carrier in my home city or on any of the dairy farms which sends milk into my city, so long is there danger that as the result of some slip in the technique of handling milk I may get typhoid. My child, carefully protected in his home, may die of a fever caught by eating the best of food over which a fly recently crawled, and I shall

never know where it was that the fly dirtied its feet for the fly can't tell. We can not protect ourselves and ours by guarding individual points; we must guard the entire line. If I wish myself and my children to be well I must help my neighbors to keep well also. The problem is a big one but will be solved not by law but by education and in that education the practicing physician must play the most prominent part.

These are the facts, and the physicians to-day are in a very unfair, unfortunate, and illogical position. We must lead in matters of public health for no one else can. Whatever our medical specialty this public duty we can not resign, to support and encourage in every way public-health movements. Hygiene and preventive medicine are the flower and fruit of the art of medicine. They bear the same relation to our profession that the apple bears to the tree that bore it or a rose to the bush on which it grew. They are not by-products, they are not incidental developments of medicine. They are its crowning glory. One can attain to the heights of preventive medicine only by the steps of clinical medicine. The victories we win in the wards become the routine of nurse or public-health officer, much as the achievement of the scientist becomes the machine for some mechanic to run. Hygiene and preventive medicine can progress to new fields only as we advance in the laboratory or hospital. We alone can appreciate the problems at stake, can outline the attack, can evaluate its success. Without the medical man's guidance and inspiration they will develop a certain routine, but truly succeed and progress, they can not. In the diagnosis and care of patients with smallpox, typhoid fever, tuberculosis, malaria, and diphtheria this is what has in large measure developed.

Now we are exploring the nervous and mental jungle and hope to develop methods for public-health officials to apply, the results of which will far surpass any of the present accomplishments of hygiene.

What then is the universities' part in this great movement? The Federal government has acted wisely in assisting in the organization of courses in hygiene in our colleges for there are some fundamental truths of health which every educated man or woman should know, just as we expect each college graduate, no matter what his major subject was, to have a greatest common divisor of knowledge of all branches and this includes accuracy in elementary arithmetic and the ability to use good English. It should include also hygiene.

But the most important duty for each university is to revamp its medical course, for in our zeal to train the students a little in all the medical specialties, we have skimped the only course in the curriculum designed to make the physician of free use to the public at large. As a result it is true that in matters of scientific hygiene our medical graduates are quite as ignorant as is the laity, and yet that is the subject towards which the student should look forward with eager anticipation realizing that it is the logical conclusion towards which all his courses have been converging.

At its meeting in March of this year the Association of American Medical Colleges voted unanimously to recommend to the various schools that they add to the senior year a course of at least ninety hours in public health and preventive medicine. The suggestion came from the directors of the Rockefeller Foundation who have found the greatest difficulty in finding physicians equipped by training for the work of the

International Health Board. We began to search for a man who could teach senior students hygiene, only to receive the reply, " We know of none in the country. We are afraid you will have to educate your own man." And we shall, for the success of any public-health movement as well as the success of private practice of the future, will depend in large degree on the moral support which the practicing physician gives it.

The very essence of medical practice is in self-sacrifice. We dare not forget to teach our students that. The medical graduate whatever his chosen specialties should be socially minded both by nature and from careful training. The fact that he is a genius, a " natural born surgeon" makes this training even more imperative. Our graduate may never serve as a public-health official but it is from him that the public-health officials should get their vision, their inspiration, and their strongest moral support. This was the idea behind the student social work at the Johns Hopkins Hospital in 1901 and later, in which over one third of the students became actively interested. They realized that the crowded curriculum might lead them to forget the patient himself and his individual human problems. This work had begun by the organization of a medical school Y. M. C. A., but this did not seem to provide just what was needed. Then the students assumed the responsibility for one night a week at the Friendly Inn Wood Yard where they tried to help the scores of tramps who congregated there for night lodgings. But that was not quite satisfactory. Then in 1901 they organized groups under the auspices of the Charity Organization Society, which later became the Department of Environmental Medicine, and tried to help the poor in order to understand them; and that

proved eminently successful. It is of interest how many of these students now are medical missionaries on the foreign field. This work may not have aroused their first interest in missions but it at least prevented other influences from weakening whatever interest they formerly may have had. These boys were the leaders of their classes, men who had every promise of successful professional careers. While we may well regret that their social influence has not been felt in America, yet we are confident that they are serving their country even better by assisting in the solution of some of those great world problems which now confront America.

Again, the universities should expand their medical schools to the utmost. The country does not need more schools but better and fuller ones. One well-trained man can care for more patients and care for each one better than three of the graduates of former years. If aided by district nurses and social-service workers, he can, thanks to the telephone, the automobile, better roads, and especially the county hospitals, minister from a county seat skillfully to many sick. The patients may not get as much medical attention but they will get better medical service and in time will appreciate this for they will always want to choose their own private doctor; they will not consent to a health officer with police powers whom others choose for them.

The university will have also a department of environmental medicine which will train social-service workers, powerful agents in the field of public health, whose function is to readjust the patient's living conditions, his conditions of work, to organize his financial support, etc. But such workers are efficient in direct

proportion as they assist the physician who has the medical responsibility of the case. The university has also a training school for nurses, the graduates of which have the vision not alone of the private case but of public-health work as school nurses, factory, community, or district nurses; for while the physician, like the army officer, may direct and plan a health campaign it is the nurse who in the role of private will actually fight the battles of the poor.

And the university has a department of public health where graduates in medicine may continue their training for public-health service. The success of these schools is surprising. Their graduates now are employed at once with fine salaries by great industrial enterprises. Some day the cities and counties also will appreciate their value and employ them as health officers. Your engineering department will train men in the sanitary sciences, men whose field is quite apart from that of physicians yet who must get their problems for solution from the medical profession. View the problem from whatever angle you will and the strategic point in the public-health field is the practicing physician not the specialist; not the consultant, but the family doctor. He can educate his community to use the health official, the nurse, and the sanitary officer as can none other. His council to the well prevents illness; his word of warning to the young man saves him from physical, mental, or moral ruin; his advice to parents saves children from defects which will render them unfit to fight; he it is, and not your professor of medicine, who writes or who does not write, proper health laws. But the better trained he is in his own specialty and the more socially minded he becomes, so much the less need will there be for the

exertion of the police power of your health boards, for man now wishes to be well and some day he will understand that to be well he must above all else be his brother's keeper.

THE UNIVERSITY AND THE DEVELOPMENT OF THE TECHNOLOGICAL SCIENCES

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THE progress of the human race has been marked by a series of revolutionary inventions and discoveries which have played an important part in the advancement of the intellectual, social, industrial, and political status of man. Among primitive peoples the needs for food, clothing, shelter, and self-protection were supplied by nature without much individual effort or thought. The development of civilization, that is, of human knowledge and experience, has increased and complicated man's requirements so that now it is only by persistent individual and coöperative effort that they can be met. The production and distribution of our food supply, the production of clothing and shelter, to meet existing standards, the maintenance of vast armaments for national protection and the present needs for transportation and communication, with all the other complex demands of modern civilization, involve the utilization of all of man's accumulated knowledge and experience and the necessity of extending his knowledge to enable him to meet more effectively the increasingly complicated problems of life.

Without doubt, the development of the steam engine more than any other single achievement has been responsible for the marvelous changes in the industrial, scientific, economic, and political life of the world during the past century. Before the steam engine was perfected

most of the work of the world was performed by muscular energy, and the conditions of human labor were intolerable in comparison with modern standards. Without power, no factory system had been developed for the manufacture of those commodities required for man's comfort and pleasure, nor had many mechanical processes been perfected. With no adequate system of land and water transportation, the surplus of one geographical section could not readily be exchanged for that of another, so it was necessary for each community to provide so far as possible for all of its needs. The world was very large in those days, while in comparison it has now grown very small because of the remarkable development in transportation and in communication. With the wireless telegraph, the most remote parts of the world may interchange thought in one tenth of a second.

When the steam engine was perfected, providing a source of power in any quantity, it was inevitable that the inventive genius of man would be stimulated and that mechanical processes would gradually supplement or replace human labor. The development of the steam locomotive and the railways and the application of the steam engine to the propulsion of ships rendered possible a more extended interchange of commodities, providing an additional stimulus for a more intensive production of manufactured and agricultural products and creating new wants and the means for supplying them. Thus, during the last century, industry has progressed with ever increasing momentum, producing new demands for scientific knowledge and research and changing the old economic life of the people and indirectly their political life.

The University and the Commonwealth

Before the advent of the steam engine there was little need for men who were expert in dealing with the forces and materials of nature and in applying them to the benefit and use of mankind. There were many skilled artisans but there was little knowledge of science as we understand the term to-day; and consequently there were few men whom we would now recognize as engineers. It is true that the demands of war required knowledge of a certain kind of engineering, military engineering, and that the need to establish boundaries to land areas, to construct bridges, buildings, and earthworks, and to deal with the disposal or distribution of water led men to study some of the problems which we now recognize as those which come within the province of the civil engineer.

In America there was little demand for the services of men familiar with civil engineering, except in various surveys, until the beginning of the nineteenth century, and it is interesting to note that it is less than a hundred years since specific instruction in the principles of civil engineering, as they were then recognized, was offered in an American educational institution. As a matter of fact, recognition of civil engineering as a profession dates from the organization of the American Society of Civil Engineers in 1852. Nineteen years later, the organization of the American Institute of Mining Engineers more definitely marked the awakening of a professional consciousness among men who were engaged in pursuits of an industrial nature.

The rapid development of the industries of the nation during the latter half of the nineteenth century led to a demand for men better prepared than the artisan and millwright to solve problems connected with the generation and transmission of power and with the design and manufacture of machinery. Mechanical

engineering as a distinct branch of the profession was not recognized until after the middle of the century, and the first instruction in the subject was given in the Massachusetts Institute of Technology in 1865. The passage of the Morrill Act in 1862, providing for the establishment of land-grant colleges in the several states and territories, was the first real recognition of the tremendous value to the country of an adequate number of men trained in the profession of engineering and prepared to become leaders in the industrial progress of the country. The graduates of these colleges have played an important part in the development and the conservation of the country's resources and their success is an eloquent testimonial to the wisdom of those statesmen who, during the darkest days of the Civil War, were able to anticipate and prepare for the future needs for industrial education.

The remarkable achievements in invention and in the development of the physical sciences during the past half century have rendered it impossible for any one man to become prepared to solve the infinite variety of problems pertaining to the modern industries, so one after another new branches of engineering have been created to meet these rapidly changing conditions. At the present time we definitely recognize the professions of architectural engineering, automotive engineering, ceramic engineering, chemical engineering, civil engineering, electrical engineering, hydraulic engineering, industrial and efficiency engineering, mechanical engineering, mining engineering, railway engineering, sanitary engineering, heat and ventilating engineering, refrigeration engineering, steam engineering, and many other divisions and subdivisions of technological science. These numerous divisions of engineering differ

chiefly in their practical applications. Each has the same foundation in mathematics, physics, chemistry, and in mechanics, thermodynamics, electricity, and other fundamental subjects.

The discoveries and achievements of Archimedes, of Galileo, of Leonardo da Vinci, of Newton and others of the earlier explorers in the realms of science laid the foundation for the future work, yet at the time that James Watt, working as a mechanician in the laboratories of the University of Glasgow, made discoveries which led to the perfection of the steam engine, he was constantly handicapped in his work through the lack of any kind of scientific information which would guide him in his experiments. Nothing was known about the properties of steam; in fact, it was but a short time before that the constitution of water itself had been determined. As a consequence of the lack of scientific knowledge many of man's most marvelous achievements have been the result of pure invention or accidental discovery. Each of these inventions or discoveries has awakened and quickened an interest in science; and in consequence, there has been an ever increasing accumulation of scientific information available for the use of those persons who are responsible for the development and maintenance of industry.

Naturally, since the institutions of higher education are the repositories of the world's accumulated knowledge, it is not at all remarkable that most of the great landmarks of science have been erected by professors and students in these institutions. Conditions in the universities are generally favorable to the development of the truth and most of them realize their responsibilities in this connection. While to the layman the obvious and apparently the chief function of a university

is to teach, that is, to impart to its students the knowledge already in existence, it should be the purpose of real universities to place scientific research and the advancement of knowledge in a position of equal importance with the work of instruction. Normally, those who are interested in the advancement of pure science are content to discover and establish the truth and they are not concerned with its useful applications. On the other hand, the exponents of applied science seek to adapt and apply the principles of pure science to the use of mankind.

As in the case of pure science, much of our knowledge of technological science has emanated from the universities and technical schools of the world. The very foundations of modern engineering practice were laid by such men as Rankin, Clausius, Regnault, Reuleaux, Unwin, and a host of others, who have established the principles of mechanics and their applications to the construction of machines and structures and who have investigated the properties of materials so that the practising engineer may now discharge his duties with a feeling of confidence in his computations and the work of construction based upon them. As has been previously indicated, the tremendous development of technical education resulting from the establishment of the land-grant colleges, with the constantly increasing number of technically educated men in industrial life, has increased the need for more exact information concerning the scientific basis for the industrial activities as well as the ability of those responsible for the advancement of these activities to utilize effectively the results of technological research. Whatever may be the future of technological research in the universities of the country as compared with such research in private lab-

oratories, the fact remains that educational institutions have blazed the way and have made the importance of such research fully apparent.

Since the development of technological science and of technical education has followed rather than preceded the development of the basic industries, it was necessary to build up these industries by empirical methods and processes, based upon practical experience, which were changed or modified when the results sought were not secured. Naturally, such methods were expensive and wasteful, but, of course, few persons cared whether a new process or method of production was the most efficient that could be obtained, but they were satisfied if it was more efficient than methods or processes which had previously been employed. Wasteful methods have characterized the development of America's industries. The vast natural resources of the country have seemed inexhaustible and there has been small regard in the past for the utilization of these resources in the most economical manner. Only during recent years have we come to understand that there is a limit to our resources in coal, oil, minerals, and soil beyond which we can not go, and that these resources must be conserved by every method which modern science can devise. The prodigality of the American people in wasting many of their most important resources has been little short of criminal.

Until recently comparatively few of the engineering industries have appreciated the value of scientific research. Now most of them are alive to its importance and many of them have undertaken its promotion by one means or another. A few of the large industrial organizations have developed splendidly equipped research laboratories devoted to the solution of problems

of fundamental importance to their own interest and not infrequently to the advancement of pure science. Other organizations have developed laboratories ostensibly devoted to research but really devoted to routine testing incident to the manufacture of their product and to the development of new machines, products, or processes. During recent years a considerable number of trade associations have been organized to study and promote the interests of the firms having membership in these associations, and in many of them, important research work has been undertaken in laboratories which they have developed, or in coöperation with private or public laboratories. As a result of the war and the need to solve a great variety of new industrial problems quickly, the interest in research has been increased enormously, and it is to be hoped that the importance of utilizing scientific methods may lead to the elimination of the waste which was so characteristic of the earlier industrial development.

Without doubt every industry is confronted with the solution of many problems which demand research of one kind or another. In many instances the success of a particular industry is dependent upon the successful solution of these problems. Such a condition is particularly the case where one concern comes into competition with another whose methods are more efficient. Under normal circumstances only the largest industries can afford to maintain their own research laboratories and a staff of competent scientists. It is very difficult to determine when a single corporation or an association of concerns having a community of interests will justify the organization of an independent research laboratory. The great expense occurred in the operation of such laboratories, the difficulty of securing properly trained

and competent men to do research work, and in many cases the failure to recognize the nature of the problems to be solved, are likely to bring many of these commercial laboratories, as well as research in general, into disrepute. A commercial organization which is forced to show suitable profits to its stockholders may have difficulty in properly evaluating the work of its own laboratories. It is not always possible to find an immediate solution of a perplexing problem, and the expense incurred in carrying on industrial research may not always appear to be justified on the basis of the results immediately obtained. It is to be expected, therefore, that in some instances research laboratories have been discredited and abandoned because of the difficulty of assigning a definite value to the output.

It is probable that in the case of most of the industries of the country the solution of their problems can best and most economically be undertaken through coöperation with the universities and technical schools. Too much emphasis can not be laid upon the fact that ordinarily such coöperative arrangements are entered into with no expectation of profit on the part of the university and that a well-equipped educational institution has scientific facilities both in apparatus and men which can not readily be duplicated in any private laboratory. Thus, in the field of engineering research as conducted in a modern university, the scientific workers have the advantages which accrue to them through association with the professors in physics, chemistry, bacteriology, and other branches of pure science which may have a direct bearing upon engineering investigations in progress. Coöperation between university departments, therefore, aside from the advantages of library and other facilities, accentuates the importance

of the university as a center for research in applied science to a greater extent than has normally been recognized. Unfortunately, many leaders in industry have looked upon men engaged in academic pursuits with some contempt. It is doubtless true, however, that this contempt for academic processes is rapidly changing and that in an ever increasing degree, the industries of the country will look to the technical schools for assistance and will coöperate with them to their own advantage as well as to the advantage and the advancement of education and knowledge. The opportunities and the responsibilities of the university for bringing about a closer association between these institutions and the industrial and business interests of the country should be recognized and every effort made to realize them. Such relations are particularly within the province of those institutions which are supported by the state; and one of the chief advantages of state educational institutions as compared with endowed institutions comes through the opportunities which the former have for service in advancing the agricultural and industrial interests of the state and country through the training of men and through one or another kind of coöperative service with the various interests in the community. It is possible for these institutions to secure and hold the interest of men of affairs because of their belief that the institutions are making large returns to the state upon the investments made in them. This is fully exemplified by the constantly increasing budgets which are cheerfully voted to the state educational institutions by the representatives of the people.

The importance of technical research and technical education in a state like Minnesota may be judged when

it is realized that more of the people of the state are engaged in the so-called engineering industries than in agriculture. Thus, the census returns for 1920 indicate that 14 per cent of the people of the state are engaged in mining, in the manufacturing and mechanical industries, in transportation and in professional work of an engineering nature, while 13.8 per cent of the people are engaged in agriculture, forestry, and animal husbandry. While no census data concerning the value of the agricultural and manufactured products of the state are available from the 1920 census, it is interesting to note that the census of 1910 discloses the fact that the annual value of all farm crops in Minnesota in 1909 was $105,425,007. This included the ordinary farm crops together with the receipts from the sale of dairy products, wool, poultry and eggs, honey, and from animals sold and slaughtered. In the same year the value of all manufactured products in the state was nearly four times as great; namely, $409,420,000. Of this amount it is interesting to note that the value added to the cost of the raw materials by the manufacturing processes was $127,798,000, a sum considerably in excess of the total value of all products produced on the farm. It is interesting to make these comparisons because Minnesota is not usually recognized as a manufacturing state. Further, the comparison is interesting because of the fact that the university has spent and is spending large sums in the advancement of knowledge of importance in agriculture and kindred lines, while it has done comparatively little for the engineering industries of the state. It is probable that the comparisons made would be even more striking if the receipts for transportation and mining were included with those from manufacturing.

Development of Technological Sciences

The first official recognition of the responsibilities of the university towards the industries of the state and country was given by the Board of Trustees of the University of Illinois when on December 8, 1903, it created the Engineering Experiment Station, whose definite purpose it is to stimulate research in applied science and to increase our knowledge of the materials and processes of engineering and the methods for the conservation of those resources upon which the engineering industries and the prosperity of the country depend. The organization of this Engineering Experiment Station has tremendously increased the interests of the university and the people of the state in technical research; and through the erection of a definite organization for the management of the research activities of the College of Engineering, it has done much to coordinate and stimulate such work within the college. As a result of the scientific output of this Engineering Experiment Station during a period of nearly eighteen years, it may be safely asserted that it has come to be recognized as one of the most important centers for the advancement of technical knowledge, maintained with funds supplied by the public, and that it is comparable in importance with some of the government scientific bureaus.

With the development of this Engineering Experiment Station its functions and responsibilities have come to be more definitely recognized. Of these the most obvious function is the conduct of general research which has been initiated by members of the teaching and scientific staffs of the College of Engineering and which is carried on by them with funds supplied by the university for the work of the station. In general, these investigations which are thus undertaken have a

peculiar appeal to the members of the staff because of their knowledge of the need for reliable information in particular subjects resulting from their own professional experience or study and their desire to secure it. The results of these investigations are of very direct value to one or another of the industries and it has been interesting and stimulating to find that they have already had a real influence in the development of engineering science and practice and that they are widely quoted by the technical press and extensively used in numerous engineering treatises.

The conduct of scientific research the results of which are not made available in convenient form for those persons who may make use of them, represents an expenditure of funds from which no adequate returns are secured. In recognition of this fact, one of the principal functions of the Engineering Experiment Station is the publication in convenient form of the results secured in the investigations which it has carried on.

As the work and activities of the Engineering Experiment Station have become known, the officers of the station have received a constantly increasing number of requests for special information and advice upon a great variety of subjects. All such requests for information where an adequate answer can be given without great difficulty, are answered.

One of the chief functions of an organization such as the Engineering Experiment Station is the training of men in the methods of scientific research. The organization of such research activities would be fully justified even though the results of the investigations which were carried on had little direct value in themselves. Possibly the chief advantage in organizing such stations

at a university rather than as independent research bureaus maintained by the state, lies in the fact that the institution attracts many brilliant young men who desire to pursue graduate study and become prepared to do scientific work. As has been previously stated, the association of the technical departments with each other and with those departments chiefly interested in pure science renders the university a more suitable location for the training of men as well as for engineering research, than is the case in laboratories maintained by commercial organizations or public research bureaus detached from educational institutions. Too great emphasis can not be laid upon this condition, for no commercial laboratory or public research bureau can offer anything like equal opportunities for training men for leadership in scientific work.

The Engineering Experiment Station is frequently called upon to do commercial testing, varying in its nature from the simple calibration of instruments and tests of materials to the performance of elaborate investigations of materials, machines, or processes, the results of which are to be considered confidential and available only to the individual or corporation for which the tests were made. Such tests are frequently desired in connection with the invention, development, or improvement of some machine or process; to determine the properties of a material to be employed in an engineering structure; or for the establishment of engineering data necessary for the successful design of apparatus or structures. In some cases such tests are desired by promoters solely for advertising purposes because of the belief that tests made in such an institution will carry the inference that the device or process tested is endorsed by the institution. It is doubtful whether re-

search bureaus maintained by educational institutions should undertake such commercial testing except under unusual circumstances. These tests interrupt and interfere with regular research activities. They encroach upon the domain of the consulting engineer and the private testing laboratory, and in consequence, they may arouse the antagonism of professional engineers whose livelihood is dependent upon activities of a similar nature. Since the Engineering Experiment Station was organized without thought of financial gain it is difficult to justify commercial testing except in those cases where the work can not readily be undertaken elsewhere and where its prosecution may be of direct or indirect benefit to the community.

Coöperation between the Engineering Experiment Station and individuals, firms, corporations, or associations in the conduct of engineering research affords the most inspiring opportunities for the investigation of large and important problems, the solution of which involves expenditures that are too large for the station to provide; for the performance of a service of immediate importance and of great value to engineers and to the public; and for the establishment of relations which will be of mutual advantage to the industries and to the institution. The chief obstacle to the establishment of such coöperative relations is the still prevalent but mistaken notion that scientific knowledge secured at the expense of a particular industrial organization should be the sole property of that organization to be used exclusively for its own advantage. Obviously our educational institutions which are supported chiefly by public funds can not be employed in the exploitation of inventions or processes or in the conduct of scientific work the benefits of which are to be withheld from

the public. Furthermore, in these days of scientific achievement no organization can long hope to keep a "trade secret" if a competitor really desires to learn the truth concerning it. Apparently this fact has come to be realized, for we find that a constantly increasing number of trade associations are being formed for the study of problems of interest to the various concerns represented. The result of a free interchange of knowledge of importance to a particular industry will benefit every concern in the industry by standardizing and improving the product and through the establishment in the minds of the public of greater confidence in the product of the industry. A state-supported research organization will be justified in undertaking coöperative research only in those instances where its chief purpose is to establish fundamental principles and physical laws which may have a wide practical application. The establishment of such laws is of direct or indirect benefit to every person, since it permits the substitution of exact knowledge for empirical methods in the design, construction, or utilization of the materials and processes of engineering. While engineers or special industries may be primarily benefited through the extension of scientific knowledge in a particular field, the public is undoubtedly benefited because commodities which it needs may be produced more economically and of better quality.

Since the establishment of the Engineering Experiment Station at the University of Illinois, many other state institutions have organized similar stations. While there may be less justification for the organization of engineering experiment stations in each state and territory than was the case in the organization of agricultural experiment stations, because of the fact

that the applications of technical science are more general and less local than is the case with the application of agricultural science, yet there is little doubt but that in the long run the establishment of such research organizations will yield returns upon the investment which will be comparable with those which have been yielded by the agricultural experiment stations.

The growing confidence of the people in the various activities of the universities of the country has led to a constant increase in the opportunities and responsibilities of these institutions. They have accomplished much in the past. They will be expected to do much more in the future. Let us hope that they will have sufficient vision to insure the proper discharge of their responsibilities in advancing and improving the status of man.

THE UNIVERSITY AND JURISPRUDENCE

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JURISPRUDENCE is a hard word. To the man on the street it is like metaphysics, psychic-analysis, and relativity; it may serve idle and incompetent highbrows as a subject for academic discussion, but it is not related to the insistent problems of everyday life, and is unworthy the attention of practical men. Law is a much nearer thing. To most of us the word law has quite a definite meaning. We see evidence of its operation on every side. The police officer on the street, the tax collector, the internal revenue officer with his income-tax forms, the inquisitive bank examiner, the unreasonable factory inspector, the jail with its barred windows, the towering court house where the judges sit, all speak convincingly of an actuality that can not be ignored. But where is there anything to give visible evidence of this jurisprudence? Even to the busy lawyer hurrying in and out of the court house, engaged in making transfers of property, filing and releasing liens, bringing and defending suits, and in all the other multitudinous mechanical processes that attend the innumerable commercial, industrial, and social adjustments incident to community life, jurisprudence is apt to be a term with little meaning and no interest.

Then what is jurisprudence? And what has the university to do with it? The taxpayer asks why his money should be taken for instruction in jurisprudence;

the legislator, whose political life depends upon the votes of the taxpayer, repeats the question even more emphatically, and university administrators inquire why other institutional enterprises of obvious utility should be hindered in the interest of a vague science of which they know neither the content nor the scope. These perfectly legitimate and natural questions I shall try to answer.

At the outset I wish frankly to say that I accept utility as the test of the value of any science or, indeed, of any human activity. I have no sympathy with the surface meaning of the famous publicist when he thanked God that he "never learned anything useful at Yale College," nor for the false sentiment that mouths such expressions as "art for art's sake," and "pure scholarship," or the slovenly thinking that in our universities differentiates utilitarian subjects from "cultural" courses. Courses may differ in honor one from the other, as their utility serves lower or higher needs of humanity, but they must all serve some useful end, or they will not and should not survive. It is just as absurd to say that a course on Italian art or in dramatic literature is less useful than one on pig-raising or ice-cream making as to assert that the Sistine Madonna is of less value than a slice of ham, or Hamlet worth less than as ice-cream cone. A savage would prefer the ham, but the civilized man with any knowledge of the higher meanings of human life would value the picture or the play more highly, unless perchance he were so desperately hungry as to become savage again. So a golf course is not less truly useful than is a plowed field, or a stock pen, though its utility serves a different need. Therefore I freely admit that if the study of jurisprudence is not useful as subserving a real need of our time

and civilization, the university should not concern itself with it.

Probably you are now ready to make the characteristic American comment, " show me." Yes, but what am I to show you? A drove of fat hogs that you may lard yourselves withal, a herd of sleek cattle that you may feast upon, gleaming steel rails that you can ride upon, or a mighty building in which you may be sheltered, or, perchance, dividends that may fatten your balance in the bank? No. None of these things. Long before the Missourian made his famous demand for ocular demonstration, Bismarck had spoken of those realities in world politics that could not be shown, or otherwise perceived by the senses. He called them " imponderables." One of the few things we see clearly in the welter of ruin, maladjustment, disorder, and disappointment in which the world now finds itself, is that those influences which are imponderable and invisible, and almost indefinable, are immeasurably the most important in determining the conduct and the welfare of the peoples of the world. Our economists had duly weighed the ponderable things and catalogued the visible things, and solemnly announced there could never again be a war between great civilized nations. The visible conditions forbade it. But as if enkindled by a bolt from the sky, the imponderable national aspirations and rivalries, with racial hatreds and sympathies, and that strange and nobly blind passion which we call patriotism. all accentuated by sharp differences in national ideals, burst into flame, and the most ruinous war in the history of human kind was waged in violation of the most fundamental rules of business and economics, and even of the master visible motive of self-interest. It is idle for the Missourian, or any of his fellow Ameri-

cans, who delight in calling themselves " hard-headed," —without, perhaps, fully appreciating all the implications of that term—to demand that he be shown the things that are imponderable and invisible. They can't be shown to the man who sees only with his eyes. Relatively speaking, the visible things aren't of any great significance, however useful and necessary they may be temporarily. The test is easy. Suppose that some unheard of catastrophe should suddenly destroy all the material wealth of this broad land, its buildings, its factories, and all other kinds of property, leaving unhurt our one hundred million people, or even one half of them. Does anyone doubt that the same courage, character, imagination and industry, and the capacity to establish and maintain law and order which once built up our material civilization would build it again? On the other hand suppose that all our millions of people, like Sennacherib's host, should perish over night and fifty million savage Hottentots could be set down in our places, with all our marvelous physical equipment left intact, ready to their hands. Within half a century, if the savage population remained undisturbed from without, the great cities would have fallen in ruins and the wilderness would have returned to occupy the pleasant lands. It is not the visible body but the invisible soul to our civilization that explains our past, gives us the present, and justifies our hopes for the future. It is to this soul that the university ministers. Technical schools care for the body in which that soul abides; and these twain can not be put asunder any more than the soul can be torn from the body of our common humanity. The university is often spoken of as the temple of learning, and well enough so; but it might be better called the temple of

faith, of that faith which is " the substance of things hoped for, the evidence of things unseen."

Of all the unseen forces that go to form that controlling invisible complex I have called the soul of our civilization, the most potent is the spirit of law. Of that force Bishop Hooker has spoken thus eloquently:

> Of law there can be no less acknowledged than that her seat is the bosom of God, her voice the harmony of the world. All things in heaven and earth do her homage,—the very least as feeling her care, the greatest as not exempted from her power; both angels and men and creatures, of what condition soever, though each in different sort and manner, yet all with uniform consent, admiring her as the mother of their peace and joy.

Just as our organized physical world is possible only because of the unseen but all-pervading force of gravitation, without which it would dissolve into a cloud of dust floating aimlessly in ethereal space, so our social order can exist only by reason of the unseen influence of law. Our national life had its beginning when the little company of Pilgrims, three centuries ago gathered in the narrow cabin of the " Mayflower," drew up and ordained for their government the famous " compact." To those men was given the vision to see that the reign of law is the absolute condition of the existence of society and of the development of civilization itself. The law touches and controls every human relation and without it none of the arts or sciences can advance or even exist. The law protects the child before it is born; unseen it stands guard over the infant in its cradle. It attends every step of the growing child, seeks to surround him with healthful influences, both physical and moral, and provides for his education, and full opportunity to fit himself to take part according to his abilities in the great struggle of life. When he is come

to manhood the law assures him of equal participation, to the measure of his skill and his strength, in the God-given blessing of fruitful work, protects him from fear and violence so that he may concentrate his strength and his mind on that work, and safeguards him in the enjoyment of the fruits of his labor. It makes a castle of the home that shelters his wife and children, and finally when life is done stands vigil over his long sleep in the churchyard. Yet throughout his long journey from the cradle to the grave he is, for the most part, if a law-abiding citizen in a well-governed country, as unconscious of the law's protecting care as he is of the ceaseless supporting pressure of the atmosphere. It is only when the law fails to perform its function that the citizen becomes acutely conscious of its existence. If his property is destroyed by rioters, if his life is endangered by robbers, or if other wrongs are inflicted upon him, he calls loudly upon the law for protection and redress. Then it is that the invisible power of the law gives visible evidence of its existence, in hurrying squads of policemen or of soldiers, or perchance in the solemn proceedings in the court room. The external signs of the majesty of the law, these agencies through which it reigns, are manifestly of great importance, just as are the fixed rules of law which determine the activities of such agencies, but they are not to be compared in ultimate significance with the spirit that exists unseen within this visible semblance. This is the meaning of Lord Coke's famous phrase, " Reason is the life of the law." A rule of law is not necessarily good; it may be positively bad. It is just as good or bad as the reason that lies behind it, and that reason is good only so far as it is consistent with the spirit of law. This term, immortalized by Montesquieu's famous treatise on

"The Spirit of the Law," has proved too sublimated for American usage. Therefore the concept has been brought to earth, and renamed "social justice." Social justice is what society needs for its proper development, just as the growing child needs a healthful environment; social justice is what all men desire and seek. But unhappily this search is like the quest of the Holy Grail. The vision of the searchers is obscured by self-interest, and too often that which is discovered and proclaimed as social justice is but such an arrangement as will best promote the interests of the individual or the group that proclaims it. Like the Holy Grail, social justice is to be discovered only by him whose heart is pure, and—one may add,—whose head is clear.

Thus we conclude that rules of law are beneficent only so far as they respond to the requirements of social justice. Jurisprudence is that science which seeks to analyze the existing rules of law, to discover their origin and understand their development during the generations of human experience through which they have come down to us, to search for and study the social influences and economic needs which have determined their history, and to ascertain how well adapted these rules are to existing social and economic conditions; in short it seeks to show what is the relationship of that body of rules which we call the law, to its indwelling spirit, social justice. This science, deemed so remote and unimportant, is thus seen to be the most important of all the sciences, since the development of all the other sciences and the progress of the arts are dependent upon it. So far is it from being academic, unrelated to the practical affairs of life, that it has been involved in every important forward step of the human race. The barons at Runnymede, in the fierce play of

selfish passion, caught some vision of a better social justice and forced King John to write in the Great Charter many of the principles that made possible the development of individual liberty in England. Still led on by the vision of a better state with better laws the English people set up the Petition of Rights, the Bill of Rights, and the long series of Parliamentary acts that enabled them to develop a freer and happier social order than had ever before been known. It was the vision of a better state that called forth the Declaration of Independence in 1776, and of a better system of government and law that led on the men who in 1787 gathered in Philadelphia to "form a more perfect union, establish justice, insure domestic tranquility...promote the general welfare," to publish the Constitution of the United States. The outer semblance of this last act of faith in the possibility of a better social order, in a higher social justice, was not much to look at. The predecessors of the famous Missourian asked to be shown. They could see only a little document of less than four thousand words, nothing like so interesting to look at as a circus poster of our day. They scorned such a poor thing. Yet I think all of us will agree that that little document has been worth more to the people of these United States, in mere dollars and cents, than ten times the value of all the lands and houses and cities then in the thirteen states; and its worth in added human happiness to the people of this land, and of all the world, is beyond computation. So it is that when any legislature has undertaken to change an old law, or to enact a new one, the reasons for its action, are found in the field of jurisprudence, and whenever a judge on the bench has been called upon to apply an old rule to a new state of facts, or to lay down a new rule where none

before existed, he recurs, to the measure of his ability and knowledge, to the principles of jurisprudence. Let me give one example. Not many years ago a will was before the English Court of Appeal for construction. There was involved the validity of a devise of valuable property to the testator's grandchildren expressed in language creating a possibility on a possibility such as had never before been before an English court for construction. Lord Justice Lindley said, " I do not know . . . the exact meaning of the old rule as to a possibility upon a possibility; and if any one turns to the passage of Coke upon Littleton where it is discussed, I hope he will understand it better than I do. I confess I do not understand it now, and never did." Nevertheless, he held that this ancient and unintelligible rule rendered void a gift which the testator wished to make, which was wise and reasonable, and contravened no principle of public policy. (*Whitby* v. *Mitchell*, C. A. 1, 1890 44 ch. div. 85). In striking down this will Lord Justice Lindley sinned doubly against the science of jurisprudence. A more thorough knowledge of the history of the alleged rule would have shown that Coke was wrong in saying that any such rule existed; and secondly, even if such a judicial rule did exist in 1620, it should not have been applied in 1890 to work unreason and injustice. A bill is now pending before the British Parliament to abrogate the rule thus so unwisely and unnecessarily fastened by Lord Justice Lindley upon the English law. In other instances which I might cite, many of them drawn from the decisions of the Supreme Court of Minnesota, the courts have refused to enforce rules of law which had lost their usefulness because of changed economic and social conditions.

If it now appears that jurisprudence, as the handmaid of social justice, is a science of great practical importance in promoting the public welfare, what is the responsibility of the university with reference to it? Very great, I should say. Nowhere else can the quest of social justice proceed with so little danger of being defeated by the vitiating influence of self-interest as in a university. This quest should be carried on through the departments of history, economics, political science, and law, the work of which is closely related and should be more effectively coördinated than is yet the case in any of our universities. It is of instruction in the law school that I wish more particularly to speak.

In my opinion American law schools have not lived up to their opportunities. Indeed, they have not even seen them. Most of them are little more than mere technical schools, training their students to use the rules of law and procedure as so many tools in the hands of craftsmen. It is quite true that these rules of law are delicate tools, a knowledge of whose use is not easily acquired, and the art of using them is indeed refined and fascinating, and the law school's first duty is undoubtedly to teach its students the fundamental rules of law and procedure, and how to find the innumerable special rules that govern civil conduct. That is, the graduate of the law school should be in the way of becoming a good craftsman. But with this most of our law schools stop. There are many teachers of law who regard these rules rigid and inevitable, of very much the same nature as if they were graven on tablets of stone. They exhaust their intellectual interest and energy in formulating them and dexterously showing the logical relation one to the other, and in making fine and hairsplitting distinctions in the application of what

may at first appear to be conflicting rules; all of which is as interesting as an argument in metaphysics or a game of chess, and well enough as far as it goes; but it does not go far enough. The rules of law are not graven by some theocratic finger on dead stone. The body of the law is a living organism and the innumerable rules are like the cells that make up its living tissue. They are alive, performing useful bodily functions, and when any cease to function and die, a healthy body casts them out to be replaced by other cells that will function. We have come to understand now that a rule of law derives the reason for its existence and the scope of its operation not from some abstract syllogism or logical deduction, but from the social and economic need in which it had its origin. It changes with the conditions that gave it life, and dies when they pass away or are so modified as no longer to respond to the rule.

The lawyers at the bar and in the legislature, and the judges on the bench are the ministers to this living, growing, changing body of the law. If their ministrations are wise and understanding, its growth is fair and its service efficient, but if they are ignorant and misdirected, the law grows distorted and disfigured, working injustice and oppression, and retarding human happiness and progress.

The university should not be content to teach law as a craft; it should also teach jurisprudence as a science. It is not sufficient to teach *what* is the rule of law; we must go farther and teach *why* is that rule. The origin and history of that rule should be studied, its modifications by statute and decision, and its present relation to other rules and to our whole modern scheme of social justice. We should learn how it functions under

the social and economic conditions of our time, and if it functions badly we should search out the reasons for its failure. For such purposes accurate data should be collected and systematized. For instance, we should know what is the cost of maintaining the courts in Minnesota, the number of cases disposed of by each of the several courts in the state, and the amount of the judgments entered in them, the length of time required to dispose of the average case, what delays occur, and what causes them. Who can say but that if information of the kind thus indicated were available a way might be discovered of greatly lessening to the people the cost of maintaining our courts, and of reducing some of the delays so vexatiously apparent in almost every litigated case. It is not creditable to our universities that almost none of such research has been done. Graduate students in other departments fairly harrow the earth to find fields for research not yet worked over. Yet in the field of jurisprudence lie great areas of unexplored and unmapped territory.

Not every change in law, proposed or made, indicates progress. In law, as in other fields of human activity, all motion is not necessarily forward. One instance will suffice. Suppose a woman who had once served as a teacher in the Central High School of Minneapolis, and afterwards became wealthy, desired to leave in her will a large sum of money to trustees with instructions to use the income in supplementing the salaries of teachers in that school. If she applies to a capable lawyer, he will tell her that her purpose can not be carried out; that such a trust would be void. But why? The woman's purpose is admirable in every way, and likely to promote the public welfare. Such a trust would be valid in almost every other state in the

world. Why not in Minnesota? For this reason. Minnesota copied her statutes on trusts from Wisconsin, which in turn copied from New York. In New York, certain persons who had no real understanding of the science of jurisprudence, procured ill-advised statutory changes in the law of trusts, that have worked out very badly. In 1893, after the unfortunate failure of the great Tilden library trust, the legislature of New York rectified its mistake, as did Wisconsin and Michigan, which had also copied the New York legislation. But Minnesota has not, though the Supreme Court of the state has shown truly wonderful ingenuity in thwarting the destructive power of this foolish law. But why has Minnesota not changed the law? Frankly stated the reason is that the lawyers in the State Bar Association and on the Judiciary Committee of the Legislature have not known enough about the nature and history of trusts to make the necessary revision. For, to their credit be it said, they have fully recognized the fact, too often ignored, that ignorant tinkering usually makes a bad law worse.

What, then, is the conclusion of the whole matter? The science of jurisprudence is not only of the highest cultural value, but of the greatest utility to the state. Instruction in jurisprudence is of even greater ultimate value to the public than technical training in the law, important as that is. To a considerable extent this technical training can be given anywhere by any men who know what the rules of law are, and have some skill in the art of teaching, but instruction in the science of jurisprudence is possible only in a university. During the period now drawing to a close only technical training in law has been given by the law faculties of most of our universities. In candor one must also say

that in too many instances these faculties have been largely recruited from very young men or from old men retired from the bench or from active practice. Too often the young men were too inexperienced to be able to think straight, and the old men too tired to think at all. Men of these types can never teach jurisprudence, which is possible only to men of accurate learning in the law, broad culture, wide experience, sound judgment, and keen imagination. One has to admit that at present there are few men in this country qualified for such a task, but it is high time that our universities should begin to encourage the type by establishing conditions in our law schools that will attract and hold gifted young men.

I hope I have shown that by the most hard-headed standards of cost-accounting, the teaching of jurisprudence, as distinguished from mere technical training in law, will be highly profitable to the state. The nobler gain I will state in the language of that distinguished lawyer and scholar, Justice Oliver Wendell Holmes, of the Supreme Court of the United States. "The University," he says, "is a place from which men start for the Eternal City. In the University are pictured the ideals which abide in the City of God. Many roads lead to that haven, and those who are here have traveled by different paths toward the goal.... My way has been by the ocean of the law. On that I have learned a part of the great lesson, the lesson not of law, but of life."

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